PRODUCT CATALOG

COMMERCIAL HVAC & INDUSTRIAL DRIVES

CERUS® X-DRIVE

franklin-controls.com

Franklin Electric

SAFETY FIRST!

As with all electrical equipment, only qualified, expert personnel should perform maintenance and installation. Comply with all applicable local and national codes and laws that regulate the installation and operation of equipment and read manuals thoroughly. Use only installation manuals and not this sales brochure for installation procedures. It is up to the installer to determine product suitability for a given application.

CERUS® X-DRIVE
VARIABLE FREQUENCY DRIVE CATALOG

For the most up-to-date product information, visit **franklin-controls.com**.

CERUS® X-DRIVE VFD (VARIABLE FREQUENCY DRIVE)

1/6–100HP (200/208VAC), 1/6–125HP (230VAC), 1/2–675+HP (460VAC),
1/2–500+ HP (575VAC), Single-Phase and 3-Phase Input
Dual Rated for Constant and Variable Torque
UL Type 1 Standalone Variable Frequency Drive

VARIABLE SPEED IS JUST THE BEGINNING

Designed for constand and variable torque application, the CERUS®® X-Drive is Franklin Electric's all-inclusive drive solution for a variety of markets. The Cerus X-Drive controller is loaded with application-specific firmware with enhanced settings that control and protect motors for the most demanding applications in HVAC and industrial markets. Available in multiple packaged configurations, including bypass and enclosed, these panels are built to last, with every detail and component centered around your requirements.

Pair this product with our legendary motors and pumps to maximize the performance of your application. All of this is backed by the best support team in the industry, making sure our business isn't what slows yours down.

Deliver More. Offer Franklin.

FULL-FEATURED FOR YOUR APPLICATION

- Streamline setup process with application-specific firmware allowing for quick and easy startups
- Applications: Basic, Supply Fan, Exhaust Fan, Vacuum, Constant Torque
- Selectable PID units include PSI, inWC, Feet, °F, °C, CFM, GPM, %, inHG, m, mBAR, BAR, kPa, LPM, CMH
- Full HP range offering allows for more versatility in project application
- Seamless integration into most automation systems with native BACnet, Modbus RTU and optional Ethernet communications
- Control up to 8 motors with built-in multi-motor control functionality
- Built-in Programmable Logic Controller (PLC) for advanced industrial applications
- UL Type 4X removable display that can be remote mounted without additional covers
- Industry leading power density which translates to a smaller footprint
- Standard UL Type 1, 12 and 3R enclosed packages available (UL Type 4X engineered to order)
- UL-Listed phase conversion versatility allows for single-phase or three-phase input

FULL-FEATURED FOR YOUR APPLICATION

Discover an incredibly intuitive start-up experience with application-specific parameters pre-set to industry standards for supply or exhaust fans, cooling tower panels, and circulating pumps.

VARYING SPEED, CONSTANT SAVINGS

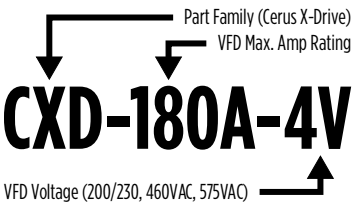
- By running your motor to meet the demand of your application, the Cerus X-Drive can reduce energy costs by up to 50%
- Variable motor speed allows for soft start, protecting the life of your equipment and offering long-term savings

CERUS® X-DRIVE VFD

ORDERING & SIZING INFORMATION (200/208/230VAC)

Voltage	Part Number	Variable Torque Applications				Constant Torque Applications			
		Single-Phase		3-Phase		Single-Phase		3-Phase	
		HP	Amps	HP	Amps	HP	Amps	HP	Amps
200VAC, Single-Phase and 3-Phase	CXD-005A-2V	1/6	2.5	1	5	1/6	2.5	1/2	3
	CXD-007A-2V	1/4	3.75	1.5	7.5	1/6	2.5	1	5
	CXD-010A-2V	1/3	5	2	10	1/4	4	2	8
	CXD-015A-2V	1/2	7.5	3	15	1/3	5.5	3	11
	CXD-021A-2V	1	10.5	5	21	3/4	8.8	3	17
	CXD-031A-2V	2	15.5	7.5	31	1.5	12.5	5	25
	CXD-046A-2V	3	23	10	46	2	16.5	10	33
	CXD-061A-2V	3	30.5	15	61	3	24.5	15	49
	CXD-075A-2V	5	37.5	20	75	5	32.5	20	65
	CXD-090A-2V	5	45	25	90	5	37.5	20	75
	CXD-105A-2V	7.5	52.5	30	105	5	45	25	90
	CXD-146A-2V	7.5	48.1	40	146	5	39.6	40	120
	CXD-180A-2V	10	59.4	50	180	7.5	48.2	40	146
	CXD-215A-2V	-	70.9	60	215	15	59.4	60	180
	CXD-276A-2V	-	91	75	276	-	71	60	215
	CXD-322A-2V	-	106.2	100	322	-	84.2	75	255
208VAC, Single-Phase and 3-Phase	CXD-005A-2V	1/2	2.5	1	5	1/6	2.5	1/2	3
	CXD-007A-2V	3/4	3.75	1.5	7.5	1/6	2.5	1	5
	CXD-010A-2V	1	5	2	10	1/3	4	2	8
	CXD-015A-2V	2	7.5	3	15	1/2	5.5	3	11
	CXD-021A-2V	2	10.5	5	21	1	8.8	5	17
	CXD-031A-2V	3	15.5	7.5	31	1.5	12.5	7.5	25
	CXD-046A-2V	5	23	10	46	2	16.5	10	33
	CXD-061A-2V	7.5	30.5	20	61	3	24.5	15	49
	CXD-075A-2V	10	37.5	25	75	5	32.5	20	65
	CXD-090A-2V	10	45	30	90	5	37.5	25	75
	CXD-105A-2V	15	52.5	30	105	7.5	45	30	90
	CXD-146A-2V	15	48.1	50	146	5	39.6	40	120
	CXD-180A-2V	20	59.4	60	180	7.5	48.2	50	146
	CXD-215A-2V	25	70.9	75	215	10	59.4	60	180
	CXD-276A-2V	30	91	100	276	-	71	75	215
	CXD-322A-2V	30	106.2	100	322	-	84.2	75	255
230VAC, Single-Phase and 3-Phase	CXD-005A-2V	1/6	2.5	1	5	1/6	2.5	1/2	3
	CXD-007A-2V	1/3	3.75	2	7.5	1/6	2.5	1	5
	CXD-010A-2V	1/2	5	3	10	1/3	4	2	8
	CXD-015A-2V	3/4	7.5	5	15	1/2	5.5	3	11
	CXD-021A-2V	1.5	10.5	7.5	21	1	8.8	5	17
	CXD-031A-2V	2	15.5	10	31	2	12.5	7.5	25
	CXD-046A-2V	3	23	15	46	2	16.5	10	33
	CXD-061A-2V	5	30.5	20	61	3	24.5	15	49
	CXD-075A-2V	5	37.5	25	75	5	32.5	20	65
	CXD-090A-2V	7.5	45	30	90	5	37.5	25	75
	CXD-105A-2V	10	52.5	40	105	7.5	45	30	90
	CXD-146A-2V	7.5	48.1	50	146	5	39.6	40	120
	CXD-180A-2V	10	59.4	60	180	7.5	48.2	50	146
	CXD-215A-2V	15	70.9	75	215	10	59.4	60	180
	CXD-276A-2V	20	91	100	276	15	71	75	215
	CXD-322A-2V	20	106.2	125	322	15	84.2	100	255

PART NUMBER ANATOMY



CERUS® X-DRIVE VFD

ORDERING & SIZING INFORMATION (460VAC)

Voltage	Part Number	Constant Torque Applications				Variable Torque Applications			
		Single-Phase		3-Phase		Single-Phase		3-Phase	
		Hp	Amps	Hp	Amps	Hp	Amps	Hp	Amps
460VAC, Single-Phase and 3-Phase	CXD-003A-4V	-	1.5	3/4	1.7	-	1.5	1	3
	CXD-004A-4V	-	1.5	1.5	3	-	2.1	2	4.2
	CXD-005A-4V	-	2	2	4	1/2	2.75	3	5.5
	CXD-008A-4V	1/2	3	3	6	1	4.25	5	8.5
	CXD-010A-4V	1	4.5	5	9	1.5	5.25	5	10.5
	CXD-013A-4V	1.5	5.3	7.5	11	2	6.5	7.5	13
	CXD-018A-4V	2	6	7.5	12	3	9	10	18
	CXD-024A-4V	3	9	10	18	3	12	15	24
	CXD-032A-4V	3	12	15	24	5	16	20	32
	CXD-038A-4V	5	16	20	32	5	19	25	38
	CXD-045A-4V	5	19	25	38	7.5	22.5	30	45
	CXD-060A-4V	7.5	22.5	30	45	10	30	40	60
	CXD-073A-4V	10	30	40	60	15	36.5	50	73
	CXD-091A-4V	10	27	50	73	10	30	60	91
	CXD-110A-4V	10	33	60	91	15	36.3	75	110
	CXD-150A-4V	15	40	75	110	20	49.5	100	150
	CXD-180A-4V	25	55	100	150	25	59.4	125	180
	CXD-220A-4V	25	65	150	180	30	72.6	150	220
	CXD-260A-4V	30	80	150	220	30	85.8	175	260
	CXD-310A-4V	40	91	200	260	40	102.3	215	310
	CXD-370A-4V	50	109	250	310	50	122.1	250	370
	CXD-460A-4V	-	130	300	370	-	151.8	300	460
	CXD-530A-4V	-	161	350	460	-	174.9	375	530
	CXD-616A-4V	-	193	450	550	-	203.28	425	616
	CXD-683A-4V	-	216	500	616	-	225.39	475	683
	CXD-770A-4V	-	240	-	683	-	254.1	536	770
	CXD-930A-4V	-	285.7	-	866	-	306.9	675	930
575VAC, Single-Phase and 3-Phase	CXD-003A-6V	-	1.25	1.5	2.5	-	1.5	2	3
	CXD-004A-6V	-	1.8	2	3.6	1.2	2.15	3	4.3
	CXD-006A-6V	1/2	2.75	3	5.5	1	3.35	5	6.7
	CXD-009A-6V	1.5	4.1	5	8.2	1.5	4.95	7.5	9.9
	CXD-012A-6V	2	5	7.5	10	2	6.05	10	12.1
	CXD-018A-6V	3	7.7	10	15.5	3	9.35	15	18.7
	CXD-024A-6V	3	9.95	15	20	5	12.1	20	24.2
	CXD-030A-6V	3	10	20	24	-	-	25	30
	CXD-036A-6V	5	12	25	30	10	15	30	36
	CXD-045A-6V	5	15	30	36	7.5	18	40	45
	CXD-054A-6V	7.5	18	40	45	10	22.5	50	54
	CXD-067A-6V	5	14.8	50	54	7.5	17.82	60	67
	CXD-086A-6V	7.5	17.8	60	67	10	22.11	75	86
	CXD-104A-6V	10	22.1	75	86	15	28.3	100	104
	CXD-125A-6V	-	-	100	104	-	-	125	125
	CXD-150A-6V	-	-	125	125	-	-	150	150
	CXD-180A-6V	-	-	150	150	-	-	150	180
	CXD-220A-6V	-	-	150	180	-	-	200	220
	CXD-290A-6V	-	-	200	220	-	-	300	290
	CXD-350A-6V	-	-	300	290	-	-	350	350
	CXD-430A-6V	-	-	350	350	-	-	450	430
	CXD-465A-6V	-	-	450	430	-	-	450	465
	CXD-590A-6V	-	-	450	465	-	-	500	590
	CXD-675A-6V	-	-	500	590	-	-	SEE MOTOR	675

STAND ALONE DRIVE OPTIONS

Descriptions
Ethernet IP and Modbus TCP/IP Communication Card

CERUS® X-DRIVE VFD

SPECIFICATIONS

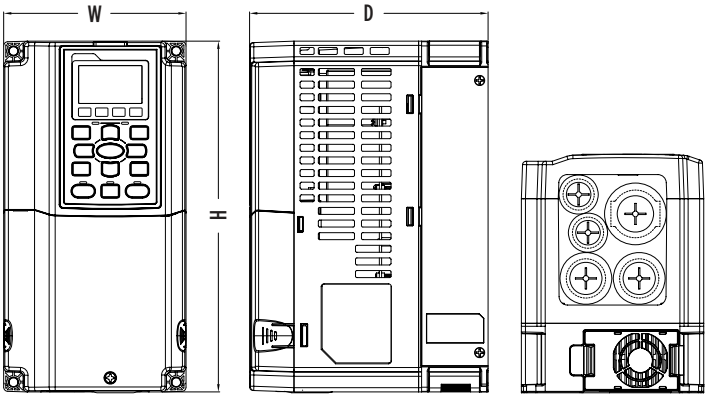
Cooling method			Forced air cooling by internal fans
Short Circuit Rating			100kA
Agency Approvals			UL and cUL listed, CE marked
Motor Controls	Control Methods		**200/208/230VAC and 460VAC models:** V/F control, SVC (Sensorless Vector Control) **575/690VAC models:** V/F and SVC
	Control Type		PWM (Pulse Width Modulation)
	Frequency Setting Resolution		**Digital Reference:** 0.01 Hz (Below 100 Hz), 0.1 Hz (Over 100 Hz) **Analog Reference:** [Max. output frequency]x 0.03/60Hz (±11 bit)
	Frequency Accuracy		**Digital:** 0.01 % of Max. Output Frequency **Analog:** 0.1 % of Max. Output Frequency
	V/F Control Curve		12 preset V/F curves and four-point square curve
	Speed Control Ratio		1:12 (5Hz-60Hz) at 60Hz maximum frequency
	Maximum Output Frequency		**200/208/230VAC models:** 599Hz (55kW and above: 400Hz); **460VAC models:** 599Hz (90kW and above: 400Hz); **575/690VAC models:** 599Hz
	Overload Capacity		**Variable Torque:** 120% of VFD rated current for 1 minute during every 5 minutes of operation. **Constant Torque:** 150% of VFD rated current for 1 minute during every 5 minutes of operation and 160% for 3 seconds during every 25 seconds of operation.
	Starting Torque		Up to 150% or higher at 0.5Hz (Torque Accuracy ±5%).
	Torque Limit (Stall level)		**Variable Torque:** Max. 130% torque current; **Constant Torque:** Max. 160% torque current
Operation	Operation Method		Keypad / Terminals / Communication (Built-in Modbus and BACnet)
	Frequency Setting		Two Analog Inputs 0- 10VDC/ 4- 20mA and One AI 0-10VDC. **Digital:** Keypad or Communication
	By Digital Inputs	Start Signal	Forward, Reverse and Jog (some features can start and stop VFD based on analog signal).
		Digital Inputs	8 programmable digital inputs can be set to any selection from long list of functions.
		Multi-Step	Up to 17 Speeds can be set including Jog by Programmable Digital Inputs.
		Accel/Decel Time and Presets	0.00- 600.00/0.0- 6000.0 seconds. Three ACC/DEC preset values switched by digital inputs or one by frequency. Additional adjustable Accel/Decel S-Curve pattern.
		Emergency Stop	Ext. Trip and Shutdown immediately interrupt VFD output in any control method.
		Jog	Jog operation with adjustable Jog frequency.
		Fault Reset	Resets VFD faults via keypad, digital input or communication. Some critical faults can only be reset by cycling the VFD power.
		Safety Inputs	SCM and STO terminals for safety circuit wiring.
	Outputs	Three Multi-Function Relays	One relay with **Form C**: 250VAC 3A/30VDC 3A contact; Two relays with **Form A:** 250VAC 1.2A/30VDC 3A. Each relay can be programmed to any selection from the functions list.
		Two Analog Outputs	**Selections:** Output Frequency, Output Current, Output Voltage, Output kW, DC Link Voltage, V1 or I input signal level. Both outputs are 0-10VDC scalable from 10 to 200%.
	General Operation Functions		DC Braking, Frequency Limit, Jump Frequencies, 2nd ACC/DEC, Auto Restart, Auto-Tuning, PID w/sleep, Flying Start, Speed Search, DC Braking, Slip Compensation, Motor Pre-heat, Temperature Foldback, Damper Control, Fireman's Override, Shutdown, etc.
	Pump Operation Functions/Protections		Pipe Fill, 2nd PID, Trigger by AI, Overpressure, ULD (Underload), HLD (High Load), Dual Demand, Pipe Leak, Broken Pipe, MMC, Multi-VFD with Lead/Lag/Standby and Jokey, Transducer redundancy, Lubrication, Screen Clean, etc.
Protection	VFD Fault Trips		Over Voltage, Low Voltage, Over Current, Overload, Short Circuit, Ground Fault, VFD Overheat, Input Phase Loss, Output Phase Open, CPU Communication Error, Signal Loss, Hardware Fault, etc.
	Motor Overload		Adjustable electronic motor overload protection.
	Overcurrent		**200/208/230/460VAC Variable Torque:** At 200% of VFD rated current, **200/208/230/460VAC Constant Torque:** At 240% of VFD rated current, **Current clamp:** Variable Torque: 130- 135%, Constant Torque 170- 175% **575/690VAC models:** At 225% VFD rated current **Current clamp:** Variable Torque: 128- 141%, Constant Torque: 170- 175%
	Overvoltage		**230VAC models:** At 410VDC DC bus voltage **460VAC models:** At 820VDC DC bus voltage **575VAC models:** At 1016VDC DC bus voltage **690VAC models:** At 1189VDC DC bus voltage
	Overtemperature		Built-in IGBT and Capacitor Bank temperature sensors
	Restart After IPF		Adjustable power loss duration up to 20 sec. Leakage current is greater than 50% of rated current of the drive.
	VFD Alarm		Stall Prevention at ACC and DEC, Overload, Thermal Sensor Fault, Capacitors High Temperature, Signal Loss, Overpressure, Underload, High Load, etc.
Keypad Display	Operation Information		Output Frequency, Output Current, Output Voltage, Frequency Reference, Operating Speed, DC Voltage, kWattmeter, Run-time, Last Trip Time, Pressure, etc.
	Fault History		The VFD stores 5 last faults.
Environment	Operating Temperature		**NEMA 1:** 14°F - 104°F (-10°C - 40°C), **Open Type:** 14°F - 122°F (-10°C - 50°C)
	Storage Temperature		-13°F - 158°F (-25°C - 70°C)
	Ambient Humidity		Up to 95% RH. (Non-Condensing)
	Altitude		Normal up to 3,300ft (1,000m). At altitude up to 2,000 m, de-rate by 1% of rated current or lower 0.5 °C of temperature for every 100m above 1,000m. Maximum altitude for Corner Grounded TN system is 2,000m. For application over 2,000m, please contact FELE for more details.
	Vibration and Impact		1mm peak to peak value from 2Hz to 13.2Hz; 0.7G- 1.0G from 13.2Hz to 55Hz; 1.0G from 55Hz to 512Hz. Comply with IEC 60068-2-6 and IEC/EN60068-2-27.
	Environmental Conditions		Pollution degree 2. No Corrosive Gas, Combustible Gas, Oil Mist or Dust. IEC60721-3-3/ IEC60364-1/ IEC60664-1

Input Efficiency (>=X%)	**Drive Frame**		**Frame A**	**Frame B**	**Frame C**	**Frame D0**	**Frame D**	**Frame E**	**Frame F**	**Frame G**	**Frame H**
	Input Voltage	**200/208/230VAC**	96	96.5	96.5	-	97	97	-	-	-
		460VAC	96	96.5	96.5	97	97	97	97	97.5	97.5
		575VAC	97	98	97	-	97	97	97	98	98

CERUS® X-DRIVE VFD

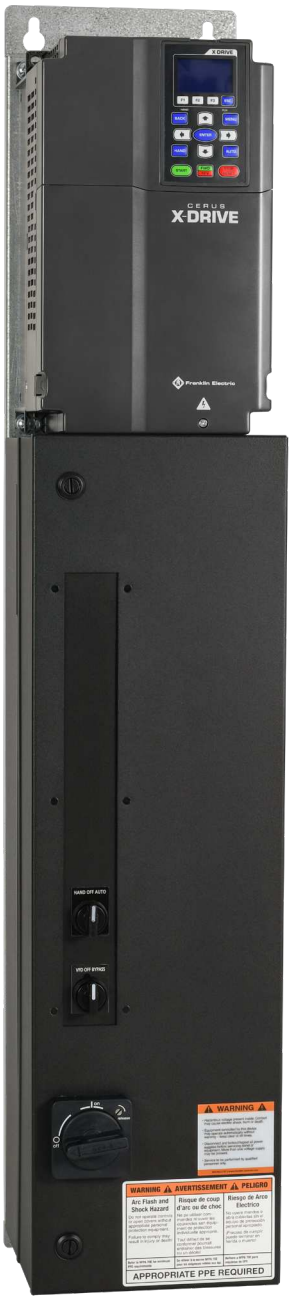
DIMENSIONS

X-Drive VFD	W X H x D	Frame Size
CXD-005A-2V– CXD-021A-2V	5.12" x 9.84" x 6.69"	A
CXD-003A-4V– CX D-018A-4V		
CXD-003A-6V– CXD-006A-6V		
CXD-031-2V– CXD-061A-2V	7.48" x 12.6" x 7.48"	B
CXD-024A-4V– CXD-038A-4V		
CXD-009A-6V– CXD-018A-6V		
CXD-075-2V– CXD-105A-2V	9.84" x 15.75" x 8.27"	C
CXD-045A-4V– CXD-073A-4V		
CXD-024A-6V– CXD-045A-6V		
CXD-091A-4V– CXD-110A-4V	11.02" x 19.69" x 10.04"	D0
CXD-146A-2V– CXD-180A-2V	12.99" x 21.65" x 10.83"	D
CXD-150A-4V– CXD-180A-4V		
CXD-054A-6V– CXD-067A-6V		
CXD-215A-2V– CXD-322A-2V	14.57" x 23.19" x 11.81"	E
CXD-220A-4V– CXD-260A-4V		
CXD-086A-6V– CXD-150A-6V		
CXD-310A-4V– CXD-370A-4V	16.54" x 31.5" x 11.81"	F
CXD-180A-6V– CXD-220A-6V		
CXD-460A-4V– CXD-530A-4V	19.69" x 39.37" x 15.63"	G
CXD-290A-6V– CXD-350A-6V		
CXD-616A-4V– CXD-930A-4V	27.56" x 56.5" x 15.91"	H
CXD-430A-6V– CXD-675A-6V		



CERUS® X-DRIVE BYPASS

1/2–50HP (200/208VAC), 1/2–60HP (230VAC), 1/2–125HP (460VAC), 1/2–60HP (575VAC), 3-Phase Input
UL Type 1, 3R or 12 Enclosed Smart Bypass Panel



BYPASS PANEL FEATURES

Standard Bypass Features

- Compact vertical design preserves wall space
- includes standard MMS disconnect, Hand-Off-Auto and VFD/Off/Bypass switches
- 3-Contactor (drive-isolation equivalent) configuration
- Harmonic mitigation device on all 575VAC panels

Easy Installation, Space Saving Design

- Reduced labor and operation costs
- Manual bypass control simplifies system operation
- 3-Contactor bypass configuration standard accross all panels
- Hand-Off-Auto switch standard on all UL Type 3R and 12 panels
- Up to 100 KAIC short-circuit rating available
- Standard UL Type 1, 12 and 3R enclosed packages available
  (UL Type 4X engineered to order)
- UL 508C and cUL rating with all drive models for complete motor protection
- Door-mounted keypad for simple programming and system access
- Optional Ethernet & Modbus TCP/IP communications card
  (BACnet and RS-485 modbus standard)
- Optional panel space heater for rugged environmental conditions (UL Type 3R panels)

PART NUMBER ANATOMY

Part Family (Cerus X-Drive)
Enclosure Rating (NEMA 1, 3R, or 12)
Panel Type (Bypass, Enclosed, or Cooling Tower)

CXD3R-BYP0340-4V-40

VFD Max. Operating Amperage (0340=034.0A)
VFD Voltage Rating (200-230VAC, 460VAC, or 575VAC)
Disconnect Amperage Rating

CERUS® X-DRIVE BYPASS

ORDERING & SIZING INFORMATION (UL TYPE 1)

Part Number	200VAC			208VAC			230VAC		
	HP	FLA	KAIC	HP	FLA	KAIC	HP	FLA	KAIC
CXD1-BYP0025-2V-2-5	1/2	2.5	100	1/2	2.4	100	1/2	2.2	100
CXD1-BYP0037-2V-4	3/4	3.7	100	3/4	3.5	100	3/4	3.2	100
CXD1-BYP0060-2V-6	1	4.8	100	1	4.6	100	1.5	6	100
CXD1-BYP0078-2V-8	2	7.8	100	2	7.5	100	2	6.8	100
CXD1-BYP096-2V-10	2	7.8	100	2	7.5	100	3	9.6	100
CXD1-BYP0110-2V-13	3	11	100	3	10.6	100	3	9.6	100
CXD1-BYP0152-2V-17	3	11	100	3	10.6	100	5	15.2	100
CXD1-BYP0220-2V-22	5	17.5	100	5	16.7	100	7.5	22	100
CXD1-BYP0253-2V-26	7.5	25.3	100	7.5	24.2	100	7.5	22	100
CXD1-BYP0280-2V-32	7.5	25.3	100	7.5	24.2	100	10	28	100
CXD1-BYP0322-2V-40	10	32.2	100	10	30.8	100	10	28	100
CXD1-BYP0483-2V-50	15	48.30	100	15	46.2	100	15	42	100
CXD1-BYP0594-2V-63	-	-	-	20	59.4	100	20	54	100
CXD1-BYP0680-2V-75	20	62.1	100	20	59.4	100	25	68	100
CXD1-BYP0782-2V-90	25	78.2	100	25	74.8	100	25	68	100
CXD1-BYP0920-2V-100	30	92	100	30	88	100	30	80	100
CXD1-BYP1200-2V-200	30	92	5	30	88	5	40	104	5
CXD1-BYP1300-2V-225	40	120	5	40	114	5	50	130	5
CXD1-BYP1540-2V-250	50	150	10	50	143	10	60	154	10

Part Number	460VAC		
	HP	FLA	KAIC
CXD1-BYP0011-4V-1	1/2	1.1	65
CXD1-BYP0016-4V-1-6	3/4	1.6	65
CXD1-BYP0021-4V-2-5	1	2.1	65
CXD1-BYP0034-4V-4	2	3.4	65
CXD1-BYP0048-4V-6	3	4.8	65
CXD1-BYP0076-4V-8	5	7.6	65
CXD1-BYP0110-4V-13	7.5	11	65
CXD1-BYP0140-4V-17	10	14	30
CXD1-BYP0210-4V-22	15	21	30
CXD1-BYP0270-4V-32	20	27	30
CXD1-BYP0340-4V-40	25	34	50
CXD1-BYP0400-4V-40	30	40	50
CXD1-BYP0520-4V-63	40	52	50
CXD1-BYP0650-4V-75	50	65	50
CXD1-BYP0770-4V-90	60	77	50
CXD1-BYP0960-4V-100	75	96	50
CXD1-BYP1240-4V-200	100	124	10
CXD1-BYP1560-4V-250	125	156	10

Part Number	575VAC		
	HP	FLA	KAIC
CXD1-BYP0009-6V-1	1/2	0.9	25
CXD1-BYP0013-6V-1-6	3/4	1.3	25
CXD1-BYP0024-6V-2-5	1.5	2.4	25
CXD1-BYP0039-6V-4	3	3.9	25
CXD1-BYP0061-6V-6	5	6.1	25
CXD1-BYP0090-6V-10	7.5	9	25
CXD1-BYP0110-6V-13	10	11	25
CXD1-BYP0170-6V-17	15	17	10
CXD1-BYP0220-6V-22	20	22	10
CXD1-BYP0270-6V-32	25	27	10
CXD1-BYP0320-6V-40	30	32	10
CXD1-BYP0410-6V-50	40	41	10
CXD1-BYP0520-6V-63	50	52	10
CXD1-BYP0620-6V-65	60	62	10

PANEL OPTIONS (UL TYPE 1)

UL TYPE 1 Bypass Option Descriptions
Bypass Pilot Light (Amber)
Fault Pilot Light (Red)
Run Pilot Light (Green)
Ethernet IP and Modbus TCP/IP Communications Card
3% Line Reactor [1]
5% Line Reactor [1]
Output Reactor (in lieu of line reactor) [2]

[1] Available for 200, 208, 230, and 460VAC models only.

[2] Output reactors come standard on all 575VAC packages and do not need to be selected for these models.

CERUS® X-DRIVE BYPASS

ORDERING & SIZING INFORMATION (UL TYPE 3R)

Part Number	200VAC			208VAC			230VAC		
	HP	FLA	KAIC	HP	FLA	KAIC	HP	FLA	KAIC
CXD3R-BYP0025-2V-2-5	1/2	2.5	100	1/2	2.4	100	1/2	2.2	100
CXD3R-BYP0037-2V-4	3/4	3.7	100	3/4	3.5	100	3/4	3.2	100
CXD3R-BYP0060-2V-6	1	4.8	100	1	4.6	100	1.5	6	100
CXD3R-BYP0078-2V-8	2	7.8	100	2	7.5	100	2	6.8	100
CXD3R-BYP096-2V-10	2	7.8	100	2	7.5	100	3	9.6	100
CXD3R-BYP0110-2V-13	3	11	100	3	10.6	100	3	9.6	100
CXD3R-BYP0152-2V-17	3	11	100	3	10.6	100	5	15.2	100
CXD3R-BYP0220-2V-22	5	17.5	100	5	16.7	100	7.5	22	100
CXD3R-BYP0253-2V-26	7.5	25.3	100	7.5	24.2	100	7.5	22	100
CXD3R-BYP0280-2V-32	7.5	25.3	100	7.5	24.2	100	10	28	100
CXD3R-BYP0322-2V-40	10	32.2	100	10	30.8	100	10	28	100
CXD3R-BYP0483-2V-50	15	48.30	100	15	46.2	100	15	42	100
CXD3R-BYP0594-2V-63	-	-	-	20	59.4	100	20	54	100
CXD3R-BYP0680-2V-75	20	62.1	100	20	59.4	100	25	68	100
CXD3R-BYP0782-2V-90	25	78.2	100	25	74.8	100	25	68	100
CXD3R-BYP0920-2V-100	30	92	100	30	88	100	30	80	100
CXD3R-BYP1200-2V-200	30	92	5	30	88	5	40	104	5
CXD3R-BYP1300-2V-225	40	120	5	40	114	5	50	130	5
CXD3R-BYP1540-2V-250	50	150	10	50	143	10	60	154	10

Part Number	460VAC		
	HP	FLA	KAIC
CXD3R-BYP0011-4V-1	1/2	1.1	65
CXD3R-BYP0016-4V-1-6	3/4	1.6	65
CXD3R-BYP0021-4V-2-5	1	2.1	65
CXD3R-BYP0034-4V-4	2	3.4	65
CXD3R-BYP0048-4V-6	3	4.8	65
CXD3R-BYP0076-4V-8	5	7.6	65
CXD3R-BYP0110-4V-13	7.5	11	65
CXD3R-BYP0140-4V-17	10	14	30
CXD3R-BYP0210-4V-22	15	21	30
CXD3R-BYP0270-4V-32	20	27	30
CXD3R-BYP0340-4V-40	25	34	50
CXD3R-BYP0400-4V-40	30	40	50
CXD3R-BYP0520-4V-63	40	52	50
CXD3R-BYP0650-4V-75	50	65	50
CXD3R-BYP0770-4V-90	60	77	50
CXD3R-BYP0960-4V-100	75	96	50
CXD3R-BYP1240-4V-200	100	124	10
CXD3R-BYP1560-4V-250	125	156	10

Part Number	575VAC		
	HP	FLA	KAIC
CXD3R-BYP0009-6V-1	1/2	0.9	25
CXD3R-BYP0013-6V-1-6	3/4	1.3	25
CXD3R-BYP0024-6V-2-5	1.5	2.4	25
CXD3R-BYP0039-6V-4	3	3.9	25
CXD3R-BYP0061-6V-6	5	6.1	25
CXD3R-BYP0090-6V-10	7.5	9	25
CXD3R-BYP0110-6V-13	10	11	25
CXD3R-BYP0170-6V-17	15	17	10
CXD3R-BYP0220-6V-22	20	22	10
CXD3R-BYP0270-6V-32	25	27	10
CXD3R-BYP0320-6V-40	30	32	10
CXD3R-BYP0410-6V-50	40	41	10
CXD3R-BYP0520-6V-63	50	52	10
CXD3R-BYP0620-6V-65	60	62	10

PANEL OPTIONS (UL TYPE 3R)

Factory Options (UL Type 3R)
Speed Potentiometer
Ethernet IP and Modbus TCP/IP Communications Card
3% Line Reactor
5% Line Reactor
dV/dT Filter [1]

Factory Options (UL Type 3R)
EMI/FRI Filter [2]
Surge Suppressor
Door-Mounted Keypad with Pad-lockable Cover
Panel Space Heater
Free-standing Foot Kit (12 inches)

[1] *Available only on 460 and 575VAC bypass panels. Selecting a dV/dT Filter for a 575VAC panel will substitute out the 575VAC output reactor as the harmonic mitigation device.*

[2] *Available on 200, 208, 230, and 460VAC panels only.*

CERUS® X-DRIVE BYPASS

ORDERING & SIZING INFORMATION (UL TYPE 12)

Part Number	200VAC			208VAC			230VAC		
	HP	FLA	KAIC	HP	FLA	KAIC	HP	FLA	KAIC
CXD12-BYP0025-2V-2-5	1/2	2.5	100	1/2	2.4	100	1/2	2.2	100
CXD12-BYP0037-2V-4	3/4	3.7	100	3/4	3.5	100	3/4	3.2	100
CXD12-BYP0060-2V-6	1	4.8	100	1	4.6	100	1.5	6	100
CXD12-BYP0078-2V-8	2	7.8	100	2	7.5	100	2	6.8	100
CXD12-BYP096-2V-10	2	7.8	100	2	7.5	100	3	9.6	100
CXD12-BYP0110-2V-13	3	11	100	3	10.6	100	3	9.6	100
CXD12-BYP0152-2V-17	3	11	100	3	10.6	100	5	15.2	100
CXD12-BYP0220-2V-22	5	17.5	100	5	16.7	100	7.5	22	100
CXD12-BYP0253-2V-26	7.5	25.3	100	7.5	24.2	100	7.5	22	100
CXD12-BYP0280-2V-32	7.5	25.3	100	7.5	24.2	100	10	28	100
CXD12-BYP0322-2V-40	10	32.2	100	10	30.8	100	10	28	100
CXD12-BYP0483-2V-50	15	48.30	100	15	46.2	100	15	42	100
CXD12-BYP0594-2V-63	-	-	-	20	59.4	100	20	54	100
CXD12-BYP0680-2V-75	20	62.1	100	20	59.4	100	25	68	100
CXD12-BYP0782-2V-90	25	78.2	100	25	74.8	100	25	68	100
CXD12-BYP0920-2V-100	30	92	100	30	88	100	30	80	100
CXD12-BYP1200-2V-200	30	92	5	30	88	5	40	104	5
CXD12-BYP1300-2V-225	40	120	5	40	114	5	50	130	5
CXD12-BYP1540-2V-250	50	150	10	50	143	10	60	154	10

Part Number	460VAC		
	HP	FLA	KAIC
CXD12-BYP0011-4V-1	1/2	1.1	65
CXD12-BYP0016-4V-1-6	3/4	1.6	65
CXD12-BYP0021-4V-2-5	1	2.1	65
CXD12-BYP0034-4V-4	2	3.4	65
CXD12-BYP0048-4V-6	3	4.8	65
CXD12-BYP0076-4V-8	5	7.6	65
CXD12-BYP0110-4V-13	7.5	11	65
CXD12-BYP0140-4V-17	10	14	30
CXD12-BYP0210-4V-22	15	21	30
CXD12-BYP0270-4V-32	20	27	30
CXD12-BYP0340-4V-40	25	34	50
CXD12-BYP0400-4V-40	30	40	50
CXD12-BYP0520-4V-63	40	52	50
CXD12-BYP0650-4V-75	50	65	50
CXD12-BYP0770-4V-90	60	77	50
CXD12-BYP0960-4V-100	75	96	50
CXD12-BYP1240-4V-200	100	124	10
CXD12-BYP1560-4V-250	125	156	10

Part Number	575VAC		
	HP	FLA	KAIC
CXD12-BYP0009-6V-1	1/2	0.9	25
CXD12-BYP0013-6V-1-6	3/4	1.3	25
CXD12-BYP0024-6V-2-5	1.5	2.4	25
CXD12-BYP0039-6V-4	3	3.9	25
CXD12-BYP0061-6V-6	5	6.1	25
CXD12-BYP0090-6V-10	7.5	9	25
CXD12-BYP0110-6V-13	10	11	25
CXD12-BYP0170-6V-17	15	17	10
CXD12-BYP0220-6V-22	20	22	10
CXD12-BYP0270-6V-32	25	27	10
CXD12-BYP0320-6V-40	30	32	10
CXD12-BYP0410-6V-50	40	41	10
CXD12-BYP0520-6V-63	50	52	10
CXD12-BYP0620-6V-65	60	62	10

PANEL OPTIONS (UL TYPE 12)

Factory Options (UL Type 12)
Speed Potentiometer
Ethernet IP and Modbus TCP/IP Communications Card
3% Line Reactor
5% Line Reactor

Factory Options (UL Type 12)
dV/dT Filter [1]
EMI/FRI Filter [2]
Surge Suppressor
Door-Mounted Keypad with Cover

[1] Available only on 460 and 575VAC bypass panels. Selecting a dV/dT Filter for a 575VAC panel will substitute out the 575VAC output reactor as the harmonic mitigation device.
[2] Available on 200, 208, 230, and 460VAC panels only.

CERUS® X-DRIVE BYPASS

SPECIFICATIONS

Cooling method			Forced air cooling by internal fans
Short Circuit Rating			100kA
Agency Approvals			UL and cUL listed, CE marked
Motor Controls	Control Methods		**200/208/230VAC and 460VAC models:** V/F control, SVC (Sensorless Vector Control) **575/690VAC models:** V/F and SVC
	Control Type		PWM (Pulse Width Modulation)
	Frequency Setting Resolution		**Digital Reference:** 0.01 Hz (Below 100 Hz), 0.1 Hz (Over 100 Hz) **Analog Reference:** [Max. output frequency]x 0.03/60Hz (±11 bit)
	Frequency Accuracy		**Digital:** 0.01 % of Max. Output Frequency **Analog:** 0.1 % of Max. Output Frequency
	V/F Control Curve		12 preset V/F curves and four-point square curve
	Speed Control Ratio		1:12 (5Hz-60Hz) at 60Hz maximum frequency
	Maximum Output Frequency		**200/208/230VAC models:** 599Hz (55kW and above: 400Hz); **460VAC models:** 599Hz (90kW and above: 400Hz); **575/690VAC models:** 599Hz
	Overload Capacity		**Variable Torque:** 120% of VFD rated current for 1 minute during every 5 minutes of operation. **Constant Torque:** 150% of VFD rated current for 1 minute during every 5 minutes of operation and 160% for 3 seconds during every 25 seconds of operation.
	Starting Torque		Up to 150% or higher at 0.5Hz (Torque Accuracy ±5%).
	Torque Limit (Stall level)		**Variable Torque:** Max. 130% torque current; **Constant Torque:** Max. 160% torque current
Operation	Operation Method		Keypad / Terminals / Communication (Built-in Modbus and BACnet)
	Frequency Setting		Two Analog Inputs 0- 10VDC/ 4- 20mA and One AI 0-10VDC. **Digital:** Keypad or Communication
	By Digital Inputs	Start Signal	Forward, Reverse and Jog (some features can start and stop VFD based on analog signal).
		Digital Inputs	8 programmable digital inputs can be set to any selection from long list of functions.
		Multi-Step	Up to 17 Speeds can be set including Jog by Programmable Digital Inputs.
		Accel/Decel Time and Presets	0.00- 600.00/0.0- 6000.0 seconds. Three ACC/DEC preset values switched by digital inputs or one by frequency. Additional adjustable Accel/Decel S-Curve pattern.
		Emergency Stop	Ext. Trip and Shutdown immediately interrupt VFD output in any control method.
		Jog	Jog operation with adjustable Jog frequency.
		Fault Reset	Resets VFD faults via keypad, digital input or communication. Some critical faults can only be reset by cycling the VFD power.
		Safety Inputs	SCM and STO terminals for safety circuit wiring.
	Outputs	Three Multi-Function Relays	One relay with **Form C**: 250VAC 3A/30VDC 3A contact; Two relays with **Form A:** 250VAC 1.2A/30VDC 3A. Each relay can be programmed to any selection from the functions list.
		Two Analog Outputs	**Selections:** Output Frequency, Output Current, Output Voltage, Output kW, DC Link Voltage, V1 or I input signal level. Both outputs are 0-10VDC scalable from 10 to 200%.
	General Operation Functions		DC Braking, Frequency Limit, Jump Frequencies, 2nd ACC/DEC, Auto Restart, Auto-Tuning, PID w/sleep, Flying Start, Speed Search, DC Braking, Slip Compensation, Motor Pre-heat, Temperature Foldback, Damper Control, Fireman's Override, Shutdown, etc.
	Pump Operation Functions/Protections		Pipe Fill, 2nd PID, Trigger by AI, Overpressure, ULD (Underload), HLD (High Load), Dual Demand, Pipe Leak, Broken Pipe, MMC, Multi-VFD with Lead/Lag/Standby and Jokey, Transducer redundancy, Lubrication, Screen Clean, etc.
Protection	VFD Fault Trips		Over Voltage, Low Voltage, Over Current, Overload, Short Circuit, Ground Fault, VFD Overheat, Input Phase Loss, Output Phase Open, CPU Communication Error, Signal Loss, Hardware Fault, etc.
	Motor Overload		Adjustable electronic motor overload protection.
	Overcurrent		**200/208/230/460VAC Variable Torque:** At 200% of VFD rated current, **200/208/230/460VAC Constant Torque:** At 240% of VFD rated current, **Current clamp:** Variable Torque: 130- 135%, Constant Torque 170- 175% **575/690VAC models:** At 225% VFD rated current **Current clamp:** Variable Torque: 128- 141%, Constant Torque: 170- 175%
	Overvoltage		**230VAC models:** At 410VDC DC bus voltage **460VAC models:** At 820VDC DC bus voltage **575VAC models:** At 1016VDC DC bus voltage **690VAC models:** At 1189VDC DC bus voltage
	Overtemperature		Built-in IGBT and Capacitor Bank temperature sensors
	Restart After IPF		Adjustable power loss duration up to 20 sec. Leakage current is greater than 50% of rated current of the drive.
	VFD Alarm		Stall Prevention at ACC and DEC, Overload, Thermal Sensor Fault, Capacitors High Temperature, Signal Loss, Overpressure, Underload, High Load, etc.
Keypad Display	Operation Information		Output Frequency, Output Current, Output Voltage, Frequency Reference, Operating Speed, DC Voltage, kWattmeter, Run-time, Last Trip Time, Pressure, etc.
	Fault History		The VFD stores 5 last faults.
Environment	Operating Temperature		**NEMA 1:** 14°F ~ 104°F (-10°C ~ 40°C), **Open Type:** 14°F ~ 122°F (-10°C ~ 50°C)
	Storage Temperature		-13°F ~ 158°F (-25°C ~ 70°C)
	Ambient Humidity		Up to 95% RH. (Non-Condensing)
	Altitude		Normal up to 3,300ft (1,000m). At altitude up to 2,000 m, de-rate by 1% of rated current or lower 0.5 °C of temperature for every 100m above 1,000m. Maximum altitude for Corner Grounded TN system is 2,000m. For application over 2,000m, please contact FELE for more details.
	Vibration and Impact		1mm peak to peak value from 2Hz to 13.2Hz; 0.7G- 1.0G from 13.2Hz to 55Hz; 1.0G from 55Hz to 512Hz. Comply with IEC 60068-2-6 and IEC/EN60068-2-27.
	Environmental Conditions		Pollution degree 2. No Corrosive Gas, Combustible Gas, Oil Mist or Dust. IEC60721-3-3/ IEC60364-1/ IEC60664-1

Inputr Efficiency (>=X%)	Drive Frame	Frame A	Frame B	Frame C	Frame D0	Frame D	Frame E	Frame F	Frame G	Frame H
Input Voltage	200/208/230VAC	96	96.5	96.5	-	97	97	-	-	-
	460VAC	96	96.5	96.5	97	97	97	97	97.5	97.5
	575VAC	97	98	97	-	97	97	97	98	98

CERUS® X-DRIVE BYPASS

DIMENSIONS

UL TYPE 1

200/208/230VAC X-Drive Bypass	H x W x D	Frame Size
CXD1-BYP0025-2V-2-5	43.1" x 8.1" x 10.5"	1
CXD1-BYP0037-2V-4		
CXD1-BYP0060-2V-6		
CXD1-BYP0078-2V-8		
CXD1-BYP096-2V-10		
CXD1-BYP0110-2V-13		
CXD1-BYP0152-2V-17		
CXD1-BYP0220-2V-22		
CXD1-BYP0253-2V-26		
CXD1-BYP0280-2V-32		
CXD1-BYP0322-2V-40		
CXD1-BYP0483-2V-50	51.5" x 10.4" x 11.2"	2
CXD1-BYP0594-2V-63		
CXD1-BYP0680-2V-75	57.6" x 12.5" x 13.0"	3
CXD1-BYP0782-2V-90		
CXD1-BYP0920-2V-100		
CXD1-BYP1200-2V-200	62.0" x 18.8" x 14.9"	4
CXD1-BYP1300-2V-225		
CXD1-BYP1540-2V-250		

460VAC X-Drive Bypass	H x W x D	Frame Size
CXD1-BYP0011-4V-1	43.1" x 8.1" x 10.5"	1
CXD1-BYP0016-4V-1-6		
CXD1-BYP0021-4V-2-5		
CXD1-BYP0034-4V-4		
CXD1-BYP0048-4V-6		
CXD1-BYP0076-4V-8		
CXD1-BYP0110-4V-13		
CXD1-BYP0140-4V-17		
CXD1-BYP0210-4V-22		
CXD1-BYP0270-4V-32		
CXD1-BYP0340-4V-40		
CXD1-BYP0400-4V-40	51.5" x 10.4" x 11.2"	2
CXD1-BYP0520-4V-63		
CXD1-BYP0650-4V-75	57.6" x 12.5" x 13.0"	3
CXD1-BYP0770-4V-90		
CXD1-BYP0960-4V-100		
CXD1-BYP1240-4V-200	62.0" x 18.8" x 14.9"	4
CXD1-BYP1560-4V-250		

575VAC X-Drive Bypass	H x W x D	Frame Size
CXD1-BYP0009-6V-1	43.1" x 8.1" x 10.5"	1
CXD1-BYP0013-6V-1-6		
CXD1-BYP0024-6V-2-5		
CXD1-BYP0039-6V-4		
CXD1-BYP0061-6V-6		
CXD1-BYP0090-6V-10		
CXD1-BYP0110-6V-13		
CXD1-BYP0170-6V-17		
CXD1-BYP0220-6V-22		
CXD1-BYP0270-6V-32	51.5" x 10.4" x 11.2"	2
CXD1-BYP0320-6V-40		
CXD1-BYP0410-6V-50		
CXD1-BYP0520-6V-63	62.0" x 18.8" x 14.9"	4
CXD1-BYP0620-6V-65		

UL TYPE 3R

200/208/230VAC X-Drive Bypass	H x W x D	Frame Size
CXD3R-BYP0025-2V-2-5	36.5" x 26.0" x 16.375"	1
CXD3R-BYP0037-2V-4		
CXD3R-BYP0060-2V-6		
CXD3R-BYP0078-2V-8		
CXD3R-BYP096-2V-10		
CXD3R-BYP0110-2V-13		
CXD3R-BYP0152-2V-17		
CXD3R-BYP0220-2V-22		
CXD3R-BYP0253-2V-26		
CXD3R-BYP0280-2V-32		
CXD3R-BYP0322-2V-40		
CXD3R-BYP0483-2V-50	41.5" x 29.0" x 16.375"	2
CXD3R-BYP0594-2V-63		
CXD3R-BYP0680-2V-75		
CXD3R-BYP0782-2V-90	46.5" x 29.0" x 16.375"	3
CXD3R-BYP0920-2V-100		
CXD3R-BYP1200-2V-200		
CXD3R-BYP1300-2V-225	51.5" x 34.0" x 20.5"	4
CXD3R-BYP1540-2V-250		

460VAC X-Drive Bypass	H x W x D	Frame Size
CXD3R-BYP0011-4V-1	36.5" x 26.0" x 16.375"	1
CXD3R-BYP0016-4V-1-6		
CXD3R-BYP0021-4V-2-5		
CXD3R-BYP0034-4V-4		
CXD3R-BYP0048-4V-6		
CXD3R-BYP0076-4V-8		
CXD3R-BYP0110-4V-13		
CXD3R-BYP0140-4V-17		
CXD3R-BYP0210-4V-22		
CXD3R-BYP0270-4V-32		
CXD3R-BYP0340-4V-40		
CXD3R-BYP0400-4V-40		
CXD3R-BYP0520-4V-63	41.5" x 29.0" x 16.375"	2
CXD3R-BYP0650-4V-75		
CXD3R-BYP0770-4V-90	46.5" x 29.0" x 16.375"	3
CXD3R-BYP0960-4V-100		
CXD3R-BYP1240-4V-200		
CXD3R-BYP1560-4V-250	51.5" x 34.0" x 20.5"	4

575VAC X-Drive Bypass	H x W x D	Frame Size
CXD32-BYP003-6V-1	36.5" x 26.0" x 16.375"	1
CXD32-BYP003-6V-1-6		
CXD32-BYP003-6V-2-5		
CXD32-BYP006-6V-4		
CXD32-BYP006-6V-6		
CXD32-BYP009-6V-10		
CXD32-BYP012-6V-13		
CXD32-BYP018-6V-17		
CXD32-BYP024-6V-22		
CXD32-BYP030-6V-32	41.5" x 29.0" x 16.375"	2
CXD32-BYP036-6V-40		
CXD32-BYP045-6V-50		
CXD32-BYP054-6V-63	51.5" x 34.0" x 20.5"	4
CXD32-BYP067-6V-65		

CERUS® X-DRIVE BYPASS

DIMENSIONS

UL TYPE 12

200/208/230VAC X-Drive Bypass	H x W x D	Frame Size
CXD12-BYP0025-2V-2-5	39.0" x 24.0" x 13.0"	1
CXD12-BYP0037-2V-4		
CXD12-BYP0060-2V-6		
CXD12-BYP0078-2V-8		
CXD12-BYP096-2V-10		
CXD12-BYP0110-2V-13		
CXD12-BYP0152-2V-17		
CXD12-BYP0220-2V-22		
CXD12-BYP0253-2V-26		
CXD12-BYP0280-2V-32	45.0" x 30.0" x 13.0"	2
CXD12-BYP0322-2V-40		
CXD12-BYP0483-2V-50		
CXD12-BYP0594-2V-63		
CXD12-BYP0680-2V-75	51.0" x 36.0" x 17.0"	3
CXD12-BYP0782-2V-90		
CXD12-BYP0920-2V-100		
CXD12-BYP1200-2V-200	63.0" x 36.0" x 21.0"	4
CXD12-BYP1300-2V-225		
CXD12-BYP1540-2V-250	63.0" x 60.0" x 25.0"	5

460VAC X-Drive Bypass	H x W x D	Frame Size
CXD12-BYP0011-4V-1	39.0" x 24.0" x 13.0"	1
CXD12-BYP0016-4V-1-6		
CXD12-BYP0021-4V-2-5		
CXD12-BYP0034-4V-4		
CXD12-BYP0048-4V-6		
CXD12-BYP0076-4V-8		
CXD12-BYP0110-4V-13		
CXD12-BYP0140-4V-17		
CXD12-BYP0210-4V-22		
CXD12-BYP0270-4V-32		
CXD12-BYP0340-4V-40	45.0" x 30.0" x 13.0"	2
CXD12-BYP0400-4V-40		
CXD12-BYP0520-4V-63		
CXD12-BYP0650-4V-75	51.0" x 36.0" x 17.0"	3
CXD12-BYP0770-4V-90		
CXD12-BYP0960-4V-100		
CXD12-BYP1240-4V-200	63.0" x 36.0" x 21.0"	4
CXD12-BYP1560-4V-250		

460VAC X-Drive Bypass	H x W x D	Frame Size
CXD3-BYP0009-6V-1	39.0" x 24.0" x 13.0"	1
CXD3-BYP0013-6V-1-6		
CXD3-BYP0024-6V-2-5		
CXD3-BYP0039-6V-4		
CXD3-BYP0061-6V-6		
CXD3-BYP0090-6V-10		
CXD3-BYP0110-6V-13		
CXD3-BYP0170-6V-17		
CXD3-BYP0220-6V-22		
CXD3-BYP0270-6V-32	45.0" x 30.0" x 13.0"	2
CXD3-BYP0320-6V-40		
CXD3-BYP0410-6V-50		
CXD3-BYP0520-6V-63	51.0" x 36.0" x 17.0"	3
CXD3-BYP0620-6V-65		

CERUS® X-DRIVE WITH ENCLOSED DISCONNECT

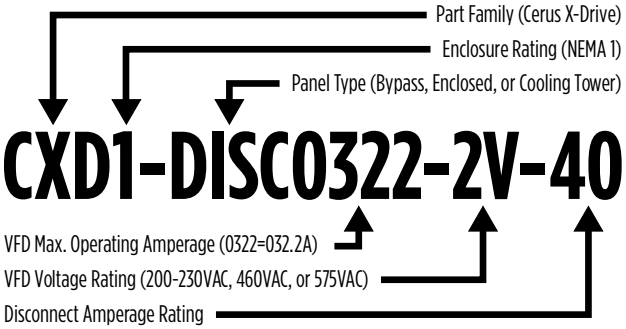
1/2–30HP (200/208/230VAC), 1/2–75HP (460VAC), 1/2–40HP (575VAC), 3-Phase Input
VFD with UL Type 1 Enclosed MMS Disconnect

PANEL FEATURES

Easy Installation, Time Saving Design

- Reduces labor costs
- UL type 1 mated-enclosure design maintains drive's UL rating while offering addition safety of MMS disconnect
- Slim-line design reduces installation footprint
- UL 508C and cUL rating with all drive models for maximum motor protection
- Optional Ethernet & Modbus TCP/IP communication card (BACnet and RS-485 modbus standard)
- Optional application-specific protective options:
  - Line reactors (3% or 5%)
  - Output Reactor (200-230VAC and 460VAC only)

PART NUMBER ANATOMY



CERUS® X-DRIVE WITH ENCLOSED DISCONNECT

ORDERING & SIZING INFORMATION

Part Number	200VAC			208VAC			230VAC		
	HP	FLA	KAIC	HP	FLA	KAIC	HP	FLA	KAIC
CXD1-DISC0025-2V-2-5	1/2	2.5	100	1/2	2.4	100	1/2	2.2	100
CXD1-DISC0037-2V-4	3/4	3.7	100	3/4	3.5	100	3/4	3.2	100
CXD1-DISC0060-2V-6	1	4.8	100	1	4.6	100	1.5	6	100
CXD1-DISC0078-2V-8	2	7.8	100	2	7.5	100	2	6.8	100
CXD1-DISC096-2V-10	2	7.8	100	2	7.5	100	3	9.6	100
CXD1-DISC0110-2V-13	3	11	100	3	10.6	100	3	9.6	100
CXD1-DISC0152-2V-17	3	11	100	3	10.6	100	5	15.2	100
CXD1-DISC0220-2V-22	5	17.5	100	5	16.7	100	7.5	22	100
CXD1-DISC0253-2V-26	7.5	25.3	100	7.5	24.2	100	7.5	22	100
CXD1-DISC0280-2V-32	7.5	25.3	100	7.5	24.2	100	10	28	100
CXD1-DISC0322-2V-40	10	32.2	100	10	30.8	100	10	28	100
CXD1-DISC0483-2V-50	15	48.30	100	15	46.2	100	15	42	100
CXD1-DISC0594-2V-63	-	-	-	20	59.4	100	20	54	100
CXD1-DISC0680-2V-75	20	62.1	100	20	59.4	100	25	68	100
CXD1-DISC0782-2V-90	25	78.2	100	25	74.8	100	25	68	100
CXD1-DISC0920-2V-100	30	92	100	30	88	100	30	80	100

Part Number	460VAC		
	HP	FLA	KAIC
CXD1-DISC0011-4V-1	1/2	1.1	65
CXD1-DISC0016-4V-1-6	3/4	1.6	65
CXD1-DISC0021-4V-2-5	1	2.1	65
CXD1-DISC0034-4V-4	2	3.4	65
CXD1-DISC0048-4V-6	3	4.8	65
CXD1-DISC0076-4V-8	5	7.6	65
CXD1-DISC0110-4V-13	7.5	11	65
CXD1-DISC0140-4V-17	10	14	30
CXD1-DISC0210-4V-22	15	21	30
CXD1-DISC0270-4V-32	20	27	30
CXD1-DISC0340-4V-40	25	34	50
CXD1-DISC0400-4V-40	30	40	50
CXD1-DISC0520-4V-63	40	52	50
CXD1-DISC0650-4V-75	50	65	50
CXD1-DISC0770-4V-90	60	77	50
CXD1-DISC0960-4V-100	75	96	50

Part Number	575VAC		
	HP	FLA	KAIC
CXD1-DISC0009-6V-1	1/2	0.9	25
CXD1-DISC0013-6V-1-6	3/4	1.3	25
CXD1-DISC0024-6V-2-5	1.5	2.4	25
CXD1-DISC0039-6V-4	3	3.9	25
CXD1-DISC0061-6V-6	5	6.1	25
CXD1-DISC0090-6V-10	7.5	9	25
CXD1-DISC0110-6V-13	10	11	25
CXD1-DISC0170-6V-17	15	17	10
CXD1-DISC0220-6V-22	20	22	10
CXD1-DISC0270-6V-32	25	27	10
CXD1-DISC0320-6V-40	30	32	10
CXD1-DISC0410-6V-50	40	41	10

PANEL OPTIONS (UL TYPE 1)

Option Descriptions
Ethernet IP and Modbus TCP/IP Communications Card
3% Line Reactor[1]
5% Line Reactor[1]
Output Reactor (in lieu of line reactor)[2]

[1] *Available for 200, 208, 230, and 460VAC models only.*

[2] *Output reactors come standard on all 575VAC packages and do not need to be selected for these models.*

CERUS® X-DRIVE WITH ENCLOSED DISCONNECT

SPECIFICATIONS

Cooling method			Forced air cooling by internal fans
Short Circuit Rating			100kA
Agency Approvals			UL and cUL listed, CE marked
Motor Controls	Control Methods		**200/208/230VAC and 460VAC models:** V/F control, SVC (Sensorless Vector Control) **575/690VAC models:** V/F and SVC
	Control Type		PWM (Pulse Width Modulation)
	Frequency Setting Resolution		**Digital Reference:** 0.01 Hz (Below 100 Hz), 0.1 Hz (Over 100 Hz) **Analog Reference:** [Max. output frequency]x 0.03/60Hz (±11 bit)
	Frequency Accuracy		**Digital:** 0.01 % of Max. Output Frequency **Analog:** 0.1 % of Max. Output Frequency
	V/F Control Curve		12 preset V/F curves and four-point square curve
	Speed Control Ratio		1:12 (5Hz-60Hz) at 60Hz maximum frequency
	Maximum Output Frequency		**200/208/230VAC models:** 599Hz (55kW and above: 400Hz); **460VAC models:** 599Hz (90kW and above: 400Hz); **575/690VAC models:** 599Hz
	Overload Capacity		**Variable Torque:** 120% of VFD rated current for 1 minute during every 5 minutes of operation. **Constant Torque:** 150% of VFD rated current for 1 minute during every 5 minutes of operation and 160% for 3 seconds during every 25 seconds of operation.
	Starting Torque		Up to 150% or higher at 0.5Hz (Torque Accuracy ±5%).
	Torque Limit (Stall level)		**Variable Torque:** Max. 130% torque current; **Constant Torque:** Max. 160% torque current
Operation	Operation Method		Keypad / Terminals / Communication (Built-in Modbus and BACnet)
	Frequency Setting		Two Analog Inputs 0- 10VDC/ 4- 20mA and One AI 0-10VDC. **Digital:** Keypad or Communication
	By Digital Inputs	Start Signal	Forward, Reverse and Jog (some features can start and stop VFD based on analog signal).
		Digital Inputs	8 programmable digital inputs can be set to any selection from long list of functions.
		Multi-Step	Up to 17 Speeds can be set including Jog by Programmable Digital Inputs.
		Accel/Decel Time and Presets	0.00- 600.00/0.0- 6000.0 seconds. Three ACC/DEC preset values switched by digital inputs or one by frequency. Additional adjustable Accel/Decel S-Curve pattern.
		Emergency Stop	Ext. Trip and Shutdown immediately interrupt VFD output in any control method.
		Jog	Jog operation with adjustable Jog frequency.
		Fault Reset	Resets VFD faults via keypad, digital input or communication. Some critical faults can only be reset by cycling the VFD power.
		Safety Inputs	SCM and STO terminals for safety circuit wiring.
	Outputs	Three Multi-Function Relays	One relay with **Form C**: 250VAC 3A/30VDC 3A contact; Two relays with **Form A:** 250VAC 1.2A/30VDC 3A. Each relay can be programmed to any selection from the functions list.
		Two Analog Outputs	**Selections:** Output Frequency, Output Current, Output Voltage, Output kW, DC Link Voltage, V1 or I input signal level. Both outputs are 0-10VDC scalable from 10 to 200%.
	General Operation Functions		DC Braking, Frequency Limit, Jump Frequencies, 2nd ACC/DEC, Auto Restart, Auto-Tuning, PID w/sleep, Flying Start, Speed Search, DC Braking, Slip Compensation, Motor Pre-heat, Temperature Foldback, Damper Control, Fireman's Override, Shutdown, etc.
	Pump Operation Functions/Protections		Pipe Fill, 2nd PID, Trigger by AI, Overpressure, ULD (Underload), HLD (High Load), Dual Demand, Pipe Leak, Broken Pipe, MMC, Multi-VFD with Lead/Lag/Standby and Jokey, Transducer redundancy, Lubrication, Screen Clean, etc.
Protection	VFD Fault Trips		Over Voltage, Low Voltage, Over Current, Overload, Short Circuit, Ground Fault, VFD Overheat, Input Phase Loss, Output Phase Open, CPU Communication Error, Signal Loss, Hardware Fault, etc.
	Motor Overload		Adjustable electronic motor overload protection.
	Overcurrent		**200/208/230/460VAC Variable Torque:** At 200% of VFD rated current, **200/208/230/460VAC Constant Torque:** At 240% of VFD rated current, **Current clamp:** Variable Torque: 130- 135%, Constant Torque 170- 175% **575/690VAC models:** At 225% VFD rated current **Current clamp:** Variable Torque: 128- 141%, Constant Torque: 170- 175%
	Overvoltage		**230VAC models:** At 410VDC DC bus voltage **460VAC models:** At 820VDC DC bus voltage **575VAC models:** At 1016VDC DC bus voltage **690VAC models:** At 1189VDC DC bus voltage
	Overtemperature		Built-in IGBT and Capacitor Bank temperature sensors
	Restart After IPF		Adjustable power loss duration up to 20 sec. Leakage current is greater than 50% of rated current of the drive.
	VFD Alarm		Stall Prevention at ACC and DEC, Overload, Thermal Sensor Fault, Capacitors High Temperature, Signal Loss, Overpressure, Underload, High Load, etc.
Keypad Display	Operation Information		Output Frequency, Output Current, Output Voltage, Frequency Reference, Operating Speed, DC Voltage, kWattmeter, Run-time, Last Trip Time, Pressure, etc.
	Fault History		The VFD stores 5 last faults.
Environment	Operating Temperature		**NEMA 1:** 14°F - 104°F (-10°C - 40°C), **Open Type:** 14°F - 122°F (-10°C - 50°C)
	Storage Temperature		-13°F - 158°F (-25°C - 70°C)
	Ambient Humidity		Up to 95% RH. (Non-Condensing)
	Altitude		Normal up to 3,300ft (1,000m). At altitude up to 2,000 m, de-rate by 1% of rated current or lower 0.5 °C of temperature for every 100m above 1,000m. Maximum altitude for Corner Grounded TN system is 2,000m. For application over 2,000m, please contact FELE for more details.
	Vibration and Impact		1mm peak to peak value from 2Hz to 13.2Hz; 0.7G- 1.0G from 13.2Hz to 55Hz; 1.0G from 55Hz to 512Hz. Comply with IEC 60068-2-6 and IEC/EN60068-2-27.
	Environmental Conditions		Pollution degree 2. No Corrosive Gas, Combustible Gas, Oil Mist or Dust. IEC60721-3-3/ IEC60364-1/ IEC60664-1

Inputr Efficiency (>=X%)	Drive Frame	Frame A	Frame B	Frame C	Frame D0	Frame D	Frame E	Frame F	Frame G	Frame H
Input Voltage	200/208/230VAC	96	96.5	96.5	-	97	97	-	-	-
	460VAC	96	96.5	96.5	97	97	97	97	97.5	97.5
	575VAC	97	98	97	-	97	97	97	98	98

CERUS® X-DRIVE WITH ENCLOSED DISCONNECT

DIMENSIONS (UL TYPE 1)

200/208/230VAC X-Drive with Disconnect	H x W x D	Frame Size
CXD1-DISC0025-2V-2-5	43.1" x 8.1" x 10.5"	1
CXD1-DISC0037-2V-4		
CXD1-DISC0060-2V-6		
CXD1-DISC0078-2V-8		
CXD1-DISC096-2V-10		
CXD1-DISC0110-2V-13		
CXD1-DISC0152-2V-17		
CXD1-DISC0220-2V-22		
CXD1-DISC0253-2V-26		
CXD1-DISC0280-2V-32		
CXD1-DISC0322-2V-40		
CXD1-DISC0483-2V-50	51.5" x 10.4" x 11.2"	2
CXD1-DISC0594-2V-63		
CXD1-DISC0680-2V-75	57.6" x 12.5" x 13.0"	3
CXD1-DISC0782-2V-90		
CXD1-DISC0920-2V-100		

460VAC X-Drive with Disconnect	H x W x D	Frame Size
CXD1-DISC0011-4V-1	43.1" x 8.1" x 10.5"	1
CXD1-DISC0016-4V-1-6		
CXD1-DISC0021-4V-2-5		
CXD1-DISC0034-4V-4		
CXD1-DISC0048-4V-6		
CXD1-DISC0076-4V-8		
CXD1-DISC0110-4V-13		
CXD1-DISC0140-4V-17		
CXD1-DISC0210-4V-22		
CXD1-DISC0270-4V-32		
CXD1-DISC0340-4V-40		
CXD1-DISC0400-4V-40	51.5" x 10.4" x 11.2"	2
CXD1-DISC0520-4V-63		
CXD1-DISC0650-4V-75	57.6" x 12.5" x 13.0"	3
CXD1-DISC0770-4V-90		
CXD1-DISC0960-4V-100		

575AC X-Drive with Disconnect	H x W x D	Frame Size
CXD1-DISC0009-6V-1	43.1" x 8.1" x 10.5"	1
CXD1-DISC0013-6V-1-6		
CXD1-DISC0024-6V-2-5		
CXD1-DISC0039-6V-4		
CXD1-DISC0061-6V-6		
CXD1-DISC0090-6V-10		
CXD1-DISC0110-6V-13		
CXD1-DISC0170-6V-17		
CXD1-DISC0220-6V-22		
CXD1-DISC0270-6V-32	51.5" x 10.4" x 11.2"	2
CXD1-DISC0320-6V-40		
CXD1-DISC0410-6V-50		

ENCLOSED CERUS® X-DRIVE VFD

1–100HP (200/208VAC), 1–125HP (230VAC),
1–600HP (460VAC), 1–600HP (575AC), 3-Phase Input
UL Type 3R and 12 Enclosed VFD

PANEL FEATURES

Designed to Withstand Harsh Environments

- Standard UL Type 3R, and 12 panels offering maximizes versatility (UL Type 4X engineered to order)
- Rainproof UL Type 3R enclosure reduces thermal absorption with white, solar-reflective finish and filtered cooling fans
- Hand-Off-Auto switch standard on all panels
- UL 508C and cUL rating with all drive models for complete motor protection
- Door-mounted keypad for simple programming and system access
- Optional application-specific protective options
  - Line and output reactors
  - dV/dT filter
  - EMI/RFI filter
- Optional Ethernet & Modbus TCP/IP communications card (BACnet and RS-485 modbus standard)
- Optional panel space heater for rugged environmental conditions (Type 3R only)

PART NUMBER ANATOMY

Part Family (Cerus X-Drive)
Enclosure Rating (NEMA 1, 3R, or 12)
Panel Type (Bypass, Enclosed, etc)

CXD3R-ED0340-4V

VFD Max. Operating Amps (0340=034.0A)
VFD Voltage Rating (200-230VAC, 460VAC, or 575VAC)

ENCLOSED CERUS® X-DRIVE VFD

ORDERING & SIZING INFORMATION (UL TYPE 3R)

Part Number	200/208VAC		
	HP	FLA	KAIC
CXD3R-ED0048-2V	1	4.8	100
CXD3R-ED0069-2V	1.5	6.9	100
CXD3R-ED0078-2V	2	7.8	100
CXD3R-ED0110-2V	3	11	100
CXD3R-ED0175-2V	5	17.5	100
CXD3R-ED0253-2V	7.5	25.3	100
CXD3R-ED0322-2V	10	32.2	100
CXD3R-ED0483-2V	15	48.3	100
CXD3R-ED0621-2V	20	62.1	100
CXD3R-ED0782-2V	25	78.2	100
CXD3R-ED0920-2V	30	92	100
CXD3R-ED1200-2V	40	120	100
CXD3R-ED1500-2V	50	150	100
CXD3R-ED1770-2V	60	177	100
CXD3R-ED2210-2V	75	221	100
CXD3R-ED2850-2V	100	285	100

Part Number	230VAC		
	HP	FLA	KAIC
CXD3R-ED0042-2V	1	4.2	100
CXD3R-ED0060-2V	1.5	6	100
CXD3R-ED0068-2V	2	6.8	100
CXD3R-ED0096-2V	3	9.6	100
CXD3R-ED0152-2V	5	15.2	100
CXD3R-ED0220-2V	7.5	22	100
CXD3R-ED0280-2V	10	28	100
CXD3R-ED0420-2V	15	42	100
CXD3R-ED0540-2V	20	54	100
CXD3R-ED0680-2V	25	68	100
CXD3R-ED0800-2V	30	80	100
CXD3R-ED1040-2V	40	104	100
CXD3R-ED1300-2V	50	130	100
CXD3R-ED1540-2V	60	154	100
CXD3R-ED1920-2V	75	192	100
CXD3R-ED2480-2V	100	248	100
CXD3R-ED3120-2V	125	312	100

Part Number	460VAC		
	HP	FLA	KAIC
CXD3R-ED0021-4V	1	2.1	100
CXD3R-ED0030-4V	1.5	3	100
CXD3R-ED0034-4V	2	3.4	100
CXD3R-ED0048-4V	3	4.8	100
CXD3R-ED0076-4V	5	7.6	100
CXD3R-ED0110-4V	7.5	11	100
CXD3R-ED0140-4V	10	14	100
CXD3R-ED0210-4V	15	21	100
CXD3R-ED0270-4V	20	27	100
CXD3R-ED0340-4V	25	34	100
CXD3R-ED0400-4V	30	40	100
CXD3R-ED0520-4V	40	52	100
CXD3R-ED0650-4V	50	65	100
CXD3R-ED0770-4V	60	77	100
CXD3R-ED0960-4V	75	96	100
CXD3R-ED1240-4V	100	124	100
CXD3R-ED1560-4V	125	156	100
CXD3R-ED1800-4V	150	180	100
CXD3R-ED2400-4V	200	240	100
CXD3R-ED3020-4V	250	302	100
CXD3R-ED3610-4V	300	361	100
CXD3R-ED4140-4V	350	414	100
CXD3R-ED4770-4V	400	477	100
CXD3R-ED5150-4V	450	515	100
CXD3R-ED5900-4V	500	590	100

Part Number	575VAC		
	HP	FLA	KAIC
CXD3R-ED0017-6V	1	1.7	100
CXD3R-ED0024-6V	1.5	2.4	100
CXD3R-ED0027-6V	2	2.7	100
CXD3R-ED0039-6V	3	3.9	100
CXD3R-ED0061-6V	5	6.1	100
CXD3R-ED0090-6V	7.5	9	100
CXD3R-ED0110-6V	10	11	100
CXD3R-ED0170-6V	15	17	100
CXD3R-ED0220-6V	20	22	100
CXD3R-ED0270-6V	25	27	100
CXD3R-ED0320-6V	30	32	100
CXD3R-ED0410-6V	40	41	100
CXD3R-ED0520-6V	50	52	100
CXD3R-ED0620-6V	60	62	100
CXD3R-ED0770-6V	75	77	100
CXD3R-ED0990-6V	100	99	100
CXD3R-ED1250-6V	125	125	100
CXD3R-ED1440-6V	150	144	100
CXD3R-ED1920-6V	200	192	100
CXD3R-ED2420-6V	250	242	100
CXD3R-ED2890-6V	300	289	100
CXD3R-ED3360-6V	350	336	100
CXD3R-ED3820-6V	400	382	100
CXD3R-ED4120-6V	450	412	100
CXD3R-ED4720-6V	500	472	100

PANEL OPTIONS (UL TYPE 3R)

Factory Options (UL Type 3R)
Manual Motor Starter Disconnect
Molded-Case Circuit Breaker Disconnect
Start/Stop Push Buttons (in lieu of HOA Switch)
Fault Pilot Light (Red)
Run Pilot Light (Green)
Speed Potentiometer
Emergency Stop Push Button
Door-Mounted Keypad with Pad-Lockable Cover
Ethernet IP and Modbus TCP/IP Communications Card

Factory Options (UL Type 3R)
3% Line Reactor
5% Line Reactor
Output Reactor [1]
dV/dT Filter [2]
EMI/RFI Filter
Surge Suppressor
Panel Space Heater
Free-standing Foot Kit (12 inches)

[1] *Available for 460VAC models only.*
[2] *Available for 460 and 575VAC models only.*

ENCLOSED CERUS® X-DRIVE VFD

ORDERING & SIZING INFORMATION (UL TYPE 12)

Part Number	200/208VAC		
	HP	FLA	KAIC
CXD12-ED0048-2V	1	4.8	100
CXD12-ED0069-2V	1.5	6.9	100
CXD12-ED0078-2V	2	7.8	100
CXD12-ED0110-2V	3	11	100
CXD12-ED0175-2V	5	17.5	100
CXD12-ED0253-2V	7.5	25.3	100
CXD12-ED0322-2V	10	32.2	100
CXD12-ED0483-2V	15	48.3	100
CXD12-ED0621-2V	20	62.1	100
CXD12-ED0782-2V	25	78.2	100
CXD12-ED0920-2V	30	92	100
CXD12-ED1200-2V	40	120	100
CXD12-ED1500-2V	50	150	100
CXD12-ED1770-2V	60	177	100
CXD12-ED2210-2V	75	221	100
CXD12-ED2850-2V	100	285	100

Part Number	230VAC		
	HP	FLA	KAIC
CXD12-ED0042-2V	1	4.2	100
CXD12-ED0060-2V	1.5	6	100
CXD12-ED0068-2V	2	6.8	100
CXD12-ED0096-2V	3	9.6	100
CXD12-ED0152-2V	5	15.2	100
CXD12-ED0220-2V	7.5	22	100
CXD12-ED0280-2V	10	28	100
CXD12-ED0420-2V	15	42	100
CXD12-ED0540-2V	20	54	100
CXD12-ED0680-2V	25	68	100
CXD12-ED0800-2V	30	80	100
CXD12-ED1040-2V	40	104	100
CXD12-ED1300-2V	50	130	100
CXD12-ED1540-2V	60	154	100
CXD12-ED1920-2V	75	192	100
CXD12-ED2480-2V	100	248	100
CXD12-ED3120-2V	125	312	100

Part Number	460VAC		
	HP	FLA	KAIC
CXD12-ED0021-4V	1	2.1	100
CXD12-ED0030-4V	1.5	3	100
CXD12-ED0034-4V	2	3.4	100
CXD12-ED0048-4V	3	4.8	100
CXD12-ED0076-4V	5	7.6	100
CXD12-ED0110-4V	7.5	11	100
CXD12-ED0140-4V	10	14	100
CXD12-ED0210-4V	15	21	100
CXD12-ED0270-4V	20	27	100
CXD12-ED0340-4V	25	34	100
CXD12-ED0400-4V	30	40	100
CXD12-ED0520-4V	40	52	100
CXD12-ED0650-4V	50	65	100
CXD12-ED0770-4V	60	77	100
CXD12-ED0960-4V	75	96	100
CXD12-ED1240-4V	100	124	100
CXD12-ED1560-4V	125	156	100
CXD12-ED1800-4V	150	180	100
CXD12-ED2400-4V	200	240	100
CXD12-ED3020-4V	250	302	100
CXD12-ED3610-4V	300	361	100
CXD12-ED4140-4V	350	414	100
CXD12-ED4770-4V	400	477	100
CXD12-ED5150-4V	450	515	100
CXD12-ED5900-4V	500	590	100

Part Number	575VAC		
	HP	FLA	KAIC
CXD12-ED0017-6V	1	1.7	100
CXD12-ED0024-6V	1.5	2.4	100
CXD12-ED0027-6V	2	2.7	100
CXD12-ED0039-6V	3	3.9	100
CXD12-ED0061-6V	5	6.1	100
CXD12-ED0090-6V	7.5	9	100
CXD12-ED0110-6V	10	11	100
CXD12-ED0170-6V	15	17	100
CXD12-ED0220-6V	20	22	100
CXD12-ED0270-6V	25	27	100
CXD12-ED0320-6V	30	32	100
CXD12-ED0410-6V	40	41	100
CXD12-ED0520-6V	50	52	100
CXD12-ED0620-6V	60	62	100
CXD12-ED0770-6V	75	77	100
CXD12-ED0990-6V	100	99	100
CXD12-ED1250-6V	125	125	100
CXD12-ED1440-6V	150	144	100
CXD12-ED1920-6V	200	192	100
CXD12-ED2420-6V	250	242	100
CXD12-ED2890-6V	300	289	100
CXD12-ED3360-6V	350	336	100
CXD12-ED3820-6V	400	382	100
CXD12-ED4120-6V	450	412	100
CXD12-ED4720-6V	500	472	100

PANEL OPTIONS (UL TYPE 12)

Factory Options
Manual Motor Starter Disconnect
Molded-Case Circuit Breaker Disconnect
Start/Stop Push Buttons (in lieu of HOA Switch)
Fault Pilot Light (Red)
Run Pilot Light (Green)
Speed Potentiometer
Emergency Stop Push Button
Door-Mounted Keypad with Cover

Factory Options
Ethernet IP and Modbus TCP/IP Communications Card
3% Line Reactor
5% Line Reactor
Output Reactor [1]
dV/dT Filter [2]
EMI/RFI Filter
Surge Suppressor

[1] *Available for 460VAC models only.*
[2] *Available for 460 and 575VAC models only.*

ENCLOSED CERUS® X-DRIVE VFD

SPECIFICATIONS

Cooling method			Forced air cooling by internal fans
Short Circuit Rating			100kA
Agency Approvals			UL and cUL listed, CE marked
Motor Controls	Control Methods		**200/208/230VAC and 460VAC models:** V/F control, SVC (Sensorless Vector Control) **575/690VAC models:** V/F and SVC
	Control Type		PWM (Pulse Width Modulation)
	Frequency Setting Resolution		**Digital Reference:** 0.01 Hz (Below 100 Hz), 0.1 Hz (Over 100 Hz) **Analog Reference:** [Max. output frequency]x 0.03/60Hz (±11 bit)
	Frequency Accuracy		**Digital:** 0.01 % of Max. Output Frequency **Analog:** 0.1 % of Max. Output Frequency
	V/F Control Curve		12 preset V/F curves and four-point square curve
	Speed Control Ratio		1:12 (5Hz-60Hz) at 60Hz maximum frequency
	Maximum Output Frequency		**200/208/230VAC models:** 599Hz (55kW and above: 400Hz); **460VAC models:** 599Hz (90kW and above: 400Hz); **575/690VAC models:** 599Hz
	Overload Capacity		**Variable Torque:** 120% of VFD rated current for 1 minute during every 5 minutes of operation. **Constant Torque:** 150% of VFD rated current for 1 minute during every 5 minutes of operation and 160% for 3 seconds during every 25 seconds of operation.
	Starting Torque		Up to 150% or higher at 0.5Hz (Torque Accuracy ±5%).
	Torque Limit (Stall level)		**Variable Torque:** Max. 130% torque current; **Constant Torque:** Max. 160% torque current
Operation	Operation Method		Keypad / Terminals / Communication (Built-in Modbus and BACnet)
	Frequency Setting		Two Analog Inputs 0- 10VDC/ 4- 20mA and One AI 0-10VDC. **Digital:** Keypad or Communication
	By Digital Inputs	Start Signal	Forward, Reverse and Jog (some features can start and stop VFD based on analog signal).
		Digital Inputs	8 programmable digital inputs can be set to any selection from long list of functions.
		Multi-Step	Up to 17 Speeds can be set including Jog by Programmable Digital Inputs.
		Accel/Decel Time and Presets	0.00- 600.00/0.0- 6000.0 seconds. Three ACC/DEC preset values switched by digital inputs or one by frequency. Additional adjustable Accel/Decel S-Curve pattern.
		Emergency Stop	Ext. Trip and Shutdown immediately interrupt VFD output in any control method.
		Jog	Jog operation with adjustable Jog frequency.
		Fault Reset	Resets VFD faults via keypad, digital input or communication. Some critical faults can only be reset by cycling the VFD power.
		Safety Inputs	SCM and STO terminals for safety circuit wiring.
	Outputs	Three Multi-Function Relays	One relay with **Form C**: 250VAC 3A/30VDC 3A contact; Two relays with **Form A:** 250VAC 1.2A/30VDC 3A. Each relay can be programmed to any selection from the functions list.
		Two Analog Outputs	**Selections:** Output Frequency, Output Current, Output Voltage, Output kW, DC Link Voltage, V1 or I input signal level. Both outputs are 0-10VDC scalable from 10 to 200%.
	General Operation Functions		DC Braking, Frequency Limit, Jump Frequencies, 2nd ACC/DEC, Auto Restart, Auto-Tuning, PID w/sleep, Flying Start, Speed Search, DC Braking, Slip Compensation, Motor Pre-heat, Temperature Foldback, Damper Control, Fireman's Override, Shutdown, etc.
	Pump Operation Functions/Protections		Pipe Fill, 2nd PID, Trigger by AI, Overpressure, ULD (Underload), HLD (High Load), Dual Demand, Pipe Leak, Broken Pipe, MMC, Multi-VFD with Lead/Lag/Standby and Jokey, Transducer redundancy, Lubrication, Screen Clean, etc.
Protection	VFD Fault Trips		Over Voltage, Low Voltage, Over Current, Overload, Short Circuit, Ground Fault, VFD Overheat, Input Phase Loss, Output Phase Open, CPU Communication Error, Signal Loss, Hardware Fault, etc.
	Motor Overload		Adjustable electronic motor overload protection.
	Overcurrent		**200/208/230/460VAC Variable Torque:** At 200% of VFD rated current, **200/208/230/460VAC Constant Torque:** At 240% of VFD rated current, **Current clamp:** Variable Torque: 130- 135%, Constant Torque 170- 175% **575/690VAC models:** At 225% VFD rated current **Current clamp:** Variable Torque: 128- 141%, Constant Torque: 170- 175%
	Overvoltage		**230VAC models:** At 410VDC DC bus voltage **460VAC models:** At 820VDC DC bus voltage **575VAC models:** At 1016VDC DC bus voltage **690VAC models:** At 1189VDC DC bus voltage
	Overtemperature		Built-in IGBT and Capacitor Bank temperature sensors
	Restart After IPF		Adjustable power loss duration up to 20 sec. Leakage current is greater than 50% of rated current of the drive.
	VFD Alarm		Stall Prevention at ACC and DEC, Overload, Thermal Sensor Fault, Capacitors High Temperature, Signal Loss, Overpressure, Underload, High Load, etc.
Keypad Display	Operation Information		Output Frequency, Output Current, Output Voltage, Frequency Reference, Operating Speed, DC Voltage, kWattmeter, Run-time, Last Trip Time, Pressure, etc.
	Fault History		The VFD stores 5 last faults.
Environment	Operating Temperature		**NEMA 1:** 14°F ~ 104°F (-10°C ~ 40°C), **Open Type:** 14°F ~ 122°F (-10°C ~ 50°C)
	Storage Temperature		-13°F ~ 158°F (-25°C ~ 70°C)
	Ambient Humidity		Up to 95% RH. (Non-Condensing)
	Altitude		Normal up to 3,300ft (1,000m). At altitude up to 2,000 m, de-rate by 1% of rated current or lower 0.5 °C of temperature for every 100m above 1,000m. Maximum altitude for Corner Grounded TN system is 2,000m. For application over 2,000m, please contact FELE for more details.
	Vibration and Impact		1mm peak to peak value from 2Hz to 13.2Hz; 0.7G- 1.0G from 13.2Hz to 55Hz; 1.0G from 55Hz to 512Hz. Comply with IEC 60068-2-6 and IEC/EN60068-2-27.
	Environmental Conditions		Pollution degree 2. No Corrosive Gas, Combustible Gas, Oil Mist or Dust. IEC60721-3-3/ IEC60364-1/ IEC60664-1

Inputr Efficiency (>=X%)	**Drive Frame**	**Frame A**	**Frame B**	**Frame C**	**Frame D0**	**Frame D**	**Frame E**	**Frame F**	**Frame G**	**Frame H**
Input Voltage	**200/208/230VAC**	96	96.5	96.5	-	97	97	-	-	-
	460VAC	96	96.5	96.5	97	97	97	97	97.5	97.5
	575VAC	97	98	97	-	97	97	97	98	98

ENCLOSED CERUS® X-DRIVE VFD

DIMENSIONS (UL TYPE 3R)

200/208VAC X-Drive Enclosed	H x W x D
CXD3R-ED0048-2V	36.5" x 26.0" x 16.375"
CXD3R-ED0069-2V	
CXD3R-ED0078-2V	
CXD3R-ED0110-2V	
CXD3R-ED0175-2V	
CXD3R-ED0253-2V	
CXD3R-ED0322-2V	
CXD3R-ED0483-2V	
CXD3R-ED0621-2V	41.5" x 29.0" x 16.375"
CXD3R-ED0782-2V	
CXD3R-ED0920-2V	
CXD3R-ED1200-2V	51.5" x 34.0" x 20.5"
CXD3R-ED1500-2V	
CXD3R-ED1770-2V	56.5" x 39.0" x 20.5"
CXD3R-ED2210-2V	
CXD3R-ED2850-2V	

230VAC X-Drive Enclosed	H x W x D
CXD3R-ED0042-2V	36.5" x 26.0" x 16.375"
CXD3R-ED0060-2V	
CXD3R-ED0068-2V	
CXD3R-ED0096-2V	
CXD3R-ED0152-2V	
CXD3R-ED0220-2V	
CXD3R-ED0280-2V	
CXD3R-ED0420-2V	
CXD3R-ED0540-2V	
CXD3R-ED0680-2V	41.5" x 29.0" x 16.375"
CXD3R-ED0800-2V	
CXD3R-ED1040-2V	46.5" x 29.0" x 16.375"
CXD3R-ED1300-2V	51.5" x 34.0" x 20.5"
CXD3R-ED1540-2V	
CXD3R-ED1920-2V	56.5" x 39.0" x 20.5"
CXD3R-ED2480-2V	
CXD3R-ED3120-2V	

460VAC X-Drive Enclosed	H x W x D
CXD3R-ED0021-4V	36.5" x 26.0" x 16.375"
CXD3R-ED0030-4V	
CXD3R-ED0034-4V	
CXD3R-ED0048-4V	
CXD3R-ED0076-4V	
CXD3R-ED0110-4V	
CXD3R-ED0140-4V	
CXD3R-ED0210-4V	
CXD3R-ED0270-4V	
CXD3R-ED0340-4V	
CXD3R-ED0400-4V	41.5" x 29.0" x 16.375"
CXD3R-ED0520-4V	
CXD3R-ED0650-4V	
CXD3R-ED0770-4V	46.5" x 29.0" x 16.375"
CXD3R-ED0960-4V	
CXD3R-ED1240-4V	51.5" x 34.0" x 20.5"
CXD3R-ED1560-4V	
CXD3R-ED1800-4V	56.5" x 39.0" x 20.5"
CXD3R-ED2400-4V	
CXD3R-ED3020-4V	
CXD3R-ED3610-4V	
CXD3R-ED4140-4V	63" x 60" x 25"
CXD3R-ED4770-4V	
CXD3R-ED5150-4V	
CXD3R-ED5900-4V	

575VAC X-Drive Enclosed	H x W x D
CXD3R-ED0017-6V	36.5" x 26.0" x 16.375"
CXD3R-ED0024-6V	
CXD3R-ED0027-6V	
CXD3R-ED0039-6V	
CXD3R-ED0061-6V	
CXD3R-ED0090-6V	
CXD3R-ED0110-6V	
CXD3R-ED0170-6V	
CXD3R-ED0220-6V	
CXD3R-ED0270-6V	41.5" x 29.0" x 16.375"
CXD3R-ED0320-6V	
CXD3R-ED0410-6V	
CXD3R-ED0520-6V	51.5" x 34.0" x 20.5"
CXD3R-ED0620-6V	
CXD3R-ED0770-6V	
CXD3R-ED0990-6V	
CXD3R-ED1250-6V	
CXD3R-ED1440-6V	
CXD3R-ED1920-6V	56.5" x 39.0" x 20.5"
CXD3R-ED2420-6V	63" x 60" x 25"
CXD3R-ED2890-6V	
CXD3R-ED3360-6V	
CXD3R-ED3820-6V	93" x 72" x 25"
CXD3R-ED4120-6V	
CXD3R-ED4720-6V	

ENCLOSED CERUS® X-DRIVE VFD

DIMENSIONS (UL TYPE 12)

200/208VAC X-Drive Enclosed	H x W x D
CXD12-ED0048-2V	39.0" x 24.0" x 13.0"
CXD12-ED0069-2V	
CXD12-ED0078-2V	
CXD12-ED0110-2V	
CXD12-ED0175-2V	
CXD12-ED0253-2V	
CXD12-ED0322-2V	
CXD12-ED0483-2V	
CXD12-ED0621-2V	45.0" x 30.0" x 13.0"
CXD12-ED0782-2V	
CXD12-ED0920-2V	
CXD12-ED1200-2V	51.0" x 36.0" x 17.0"
CXD12-ED1500-2V	
CXD12-ED1770-2V	63.0" x 36.0" x 21.0"
CXD12-ED2210-2V	
CXD12-ED2850-2V	

230VAC X-Drive Enclosed	H x W x D
CXD12-ED0042-2V	39.0" x 24.0" x 13.0"
CXD12-ED0060-2V	
CXD12-ED0068-2V	
CXD12-ED0096-2V	
CXD12-ED0152-2V	
CXD12-ED0220-2V	
CXD12-ED0280-2V	
CXD12-ED0420-2V	
CXD12-ED0540-2V	
CXD12-ED0680-2V	45.0" x 30.0" x 13.0"
CXD12-ED0800-2V	
CXD12-ED1040-2V	51.0" x 36.0" x 17.0"
CXD12-ED1300-2V	
CXD12-ED1540-2V	
CXD12-ED1920-2V	63.0" x 36.0" x 21.0"
CXD12-ED2480-2V	
CXD12-ED3120-2V	

460VAC X-Drive Enclosed	H x W x D
CXD12-ED0021-4V	39.0" x 24.0" x 13.0"
CXD12-ED0030-4V	
CXD12-ED0034-4V	
CXD12-ED0048-4V	
CXD12-ED0076-4V	
CXD12-ED0110-4V	
CXD12-ED0140-4V	
CXD12-ED0210-4V	
CXD12-ED0270-4V	
CXD12-ED0340-4V	
CXD12-ED0400-4V	45.0" x 30.0" x 13.0"
CXD12-ED0520-4V	
CXD12-ED0650-4V	
CXD12-ED0770-4V	51.0" x 36.0" x 17.0"
CXD12-ED0960-4V	
CXD12-ED1240-4V	
CXD12-ED1560-4V	
CXD12-ED1800-4V	63.0" x 36.0" x 21.0"
CXD12-ED2400-4V	
CXD12-ED3020-4V	
CXD12-ED3610-4V	
CXD12-ED4140-4V	
CXD12-ED4770-4V	
CXD12-ED5150-4V	
CXD12-ED5900-4V	93.0" x 72.0" x 25.0"

575VAC X-Drive Enclosed	H x W x D
CXD12-ED0017-6V	39.0" x 24.0" x 13.0"
CXD12-ED0024-6V	
CXD12-ED0027-6V	
CXD12-ED0039-6V	
CXD12-ED0061-6V	
CXD12-ED0090-6V	
CXD12-ED0110-6V	
CXD12-ED0170-6V	
CXD12-ED0220-6V	
CXD12-ED0270-6V	45.0" x 30.0" x 13.0"
CXD12-ED0320-6V	
CXD12-ED0410-6V	
CXD12-ED0520-6V	51.0" x 36.0" x 17.0"
CXD12-ED0620-6V	
CXD12-ED0770-6V	
CXD12-ED0990-6V	
CXD12-ED1250-6V	
CXD12-ED1440-6V	
CXD12-ED1920-6V	63.0" x 36.0" x 21.0"
CXD12-ED2420-6V	
CXD12-ED2890-6V	
CXD12-ED3360-6V	
CXD12-ED3820-6V	93.0" x 72.0" x 25.0"w
CXD12-ED4120-6V	
CXD12-ED4720-6V	

CERUS® X-DRIVE COOLING TOWER CONTROLLER

1–40HP (200/208/230VAC), 1–125HP (460VAC), 3-Phase Input
Stand Alone or Building Automation Controlled Options
Energy Saving VFDs

PANEL FEATURES

Integrates With An Existing Automation Systems or Temperature Control Option for Standalone Application

- Scalable options to meet any application
- Adequately sized for additional options including spray pump, basin heater control, line reactors, and other critical features

Cerus® X-Drive for Optimum Performance

- Space-vector control for clean sinewave output for efficiency and enhanced motor life
- Automatic energy savings mode
- Dual PID controls: primary for maintaining temperature, pressure, etc. and secondary for PID control of external device
- Standard kWh metering of energy usage to optimize control

Multiple PID Set Points

- Programmable and selectable for maintaining pressure/temperature during different seasons or operating conditions

Standard Integrated HOA and 3-Contactor Bypass

- Integrated HOA and status indications for simplified operation
- VFD isolating three contactor bypass with disconnect options standard

Single Source Control Reduces Components and Increases Reliability

- Wide range of options available
- One connection point for power

Temperature Control Option Provides Complete Stand-Alone Operation

- Ideal for retrofit
- Start/stop sequencing for fans, dampers, and spray pumps
- Provides analog output to vary speed of drive
- Accepts direct input from RTD type sensor or thermocouple
- Adjustments for set-points and hysteresis

OPTIONAL FEATURES

Basin Heater Control

- Prevents freezing
- Contactor activated by external signal (i.e.thermostat)
- Provision for low water protection

Vibration Cutout

- Provision for vibration switch cut-out

2-Stage Temperature Control

- Start/stop sequencing for fans, dampers, and spray pumps
- Provides analog output to vary speed of drive
- Accepts direct input from RTD type sensor or thermocouple
- Adjustments for set-points and hysteresis

Output Reactor/Filters

- Use when leads from drive to motor exceed 35' at 460 VAC or greater
- Above 100' use output filter
- Decreases level of voltage spikes to prevent motor insulation breakdown

Spray Pump Starter

- Full-voltage starter with overload relay
- HOA switch provided
- Status indication options

Water Level Control Power

- Provides 120VAC @ 2A

Line Reactors

- For use in systems with unstable utility power, long leads from service transformer to VFD, and/or when power source is greater than 10 times the kVA rating of the inverter
- Provides harmonic distortion filtering

Panel Space Heater

- To prevent condensation and freezing

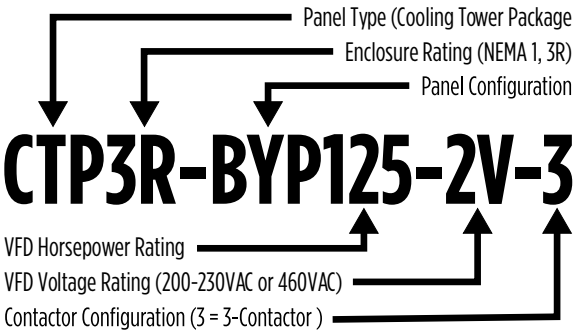
CERUS® X-DRIVE COOLING TOWER CONTROLLER

ORDERING & SIZING INFORMATION

Cooling Tower Control, 200/208/230VAC, 3-Phase			
HP	FLA	UL Type 1 Part Number	UL Type 3R Part Number
1	4.6	CTP1-BYP001-2V-3	CTP3R-BYP001-2V-3
2	6.6	CTP1-BYP002-2V-3	CTP3R-BYP002-2V-3
3	10.6	CTP1-BYP003-2V-3	CTP3R-BYP003-2V-3
5	16.7	CTP1-BYP005-2V-3	CTP3R-BYP005-2V-3
7.5	24.2	CTP1-BYP007-2V-3	CTP3R-BYP007-2V-3
10	30.8	CTP1-BYP010-2V-3	CTP3R-BYP010-2V-3
15	46.2	CTP1-BYP015-2V-3	CTP3R-BYP015-2V-3
20	59.4	CTP1-BYP020-2V-3	CTP3R-BYP020-2V-3
25	74.8	CTP1-BYP025-2V-3	CTP3R-BYP025-2V-3
30	88	CTP1-BYP030-2V-3	CTP3R-BYP030-2V-3
40	114	CTP1-BYP040-2V-3	CTP3R-BYP040-2V-3

Cooling Tower Control, 460VAC, 3-Phase Input			
HP	FLA	UL Type 1	UL Type 3R
1	2.1	CTP1-BYP001-4V-3	CTP3R-BYP001-4V-3
2	3.4	CTP1-BYP002-4V-3	CTP3R-BYP002-4V-3
3	4.8	CTP1-BYP003-4V-3	CTP3R-BYP003-4V-3
5	7.6	CTP1-BYP005-4V-3	CTP3R-BYP005-4V-3
7.5	11	CTP1-BYP007-4V-3	CTP3R-BYP007-4V-3
10	14	CTP1-BYP010-4V-3	CTP3R-BYP010-4V-3
15	21	CTP1-BYP015-4V-3	CTP3R-BYP015-4V-3
20	27	CTP1-BYP020-4V-3	CTP3R-BYP020-4V-3
25	34	CTP1-BYP025-4V-3	CTP3R-BYP025-4V-3
30	40	CTP1-BYP030-4V-3	CTP3R-BYP030-4V-3
40	52	CTP1-BYP040-4V-3	CTP3R-BYP040-4V-3
50	65	CTP1-BYP050-4V-3	CTP3R-BYP050-4V-3
60	77	-	CTP3R-BYP060-4V-3
75	96	-	CTP3R-BYP075-4V-3
100	124	-	CTP3R-BYP100-4V-3
125	156	-	CTP3R-BYP125-4V-3
150	180	-	CTP3R-BYP150-4V-3

PART NUMBER ANATOMY



PANEL OPTIONS

Panel Options
Run Pilot Light (Green Standard)
Bypass Pilot Light (Amber Standard)
Fault Pilot Light (Red Standard)
Off Pilot Light (Red Standard)
Temperature Controller
3-Phase Temperature Controller

Panel Options
60W Panel Space Heater
150W Panel Space Heater
250W Panel Space Heater
Motor Heater
Immersion Temperature Sensor, 2.5"

Basin Heater Contactor				
kW			Max Amps	Basin Heater
200/208V	230V	460V		
3/4	3/4	2	2.5	CTP-9/HI-2.5
1	1.5	3	4.0	CTP-9/HI-4
2	2	4	6.0	CTP-9/HI-6
2.5	3	6	8.0	CTP-9/HI-8
3	3.5	8	10.0	CTP-18/HI-10
4	5	10	13.0	CTP-18/HI-13
6	6.5	14	17.0	CTP-18/HI-17
7.5	8.5	18	22.0	CTP-32/HI-22
9	10	21	26.0	CTP-32/HI-26
11	12	26	32.0	CTP-32/HI-32

Spray Pump Starter			
3 Phase HP			Spray Pump
200/208V	230V	460V	
1/2	1/2	1	CTP-9/H-2.5
3/4	3/4	2	CTP-9/H-4
1	1.5	3	CTP-9/H-6
2	2	5	CTP-9/H-8
2	3	5	CTP-18/H-10
3	3	7.5	CTP-18/H-13
3	5	10	CTP-18/H-17
5	7.5	15	CTP-32/H-22
7.5	7.5	15	CTP-32/H-26
7.5	10	20	CTP-32/H-32

CERUS® X-DRIVE COOLING TOWER CONTROLLER

SPECIFICATIONS

Cooling method			Forced air cooling by internal fans
Short Circuit Rating			100kA
Agency Approvals			UL and cUL listed, CE marked
Motor Controls	Control Methods		**200/208/230VAC and 460VAC models:** V/F control, SVC (Sensorless Vector Control) **575/690VAC models:** V/F and SVC
	Control Type		PWM (Pulse Width Modulation)
	Frequency Setting Resolution		**Digital Reference:** 0.01 Hz (Below 100 Hz), 0.1 Hz (Over 100 Hz) **Analog Reference:** [Max. output frequency]x 0.03/60Hz (±11 bit)
	Frequency Accuracy		**Digital:** 0.01 % of Max. Output Frequency **Analog:** 0.1 % of Max. Output Frequency
	V/F Control Curve		12 preset V/F curves and four-point square curve
	Speed Control Ratio		1:12 (5Hz-60Hz) at 60Hz maximum frequency
	Maximum Output Frequency		**200/208/230VAC models:** 599Hz (55kW and above: 400Hz); **460VAC models:** 599Hz (90kW and above: 400Hz); **575/690VAC models:** 599Hz
	Overload Capacity		**Variable Torque:** 120% of VFD rated current for 1 minute during every 5 minutes of operation. **Constant Torque:** 150% of VFD rated current for 1 minute during every 5 minutes of operation and 160% for 3 seconds during every 25 seconds of operation.
	Starting Torque		Up to 150% or higher at 0.5Hz (Torque Accuracy ±5%).
	Torque Limit (Stall level)		**Variable Torque:** Max. 130% torque current; **Constant Torque:** Max. 160% torque current
Operation	Operation Method		Keypad / Terminals / Communication (Built-in Modbus and BACnet)
	Frequency Setting		Two Analog Inputs 0- 10VDC/ 4- 20mA and One AI 0-10VDC. **Digital:** Keypad or Communication
	By Digital Inputs	Start Signal	Forward, Reverse and Jog (some features can start and stop VFD based on analog signal).
		Digital Inputs	8 programmable digital inputs can be set to any selection from long list of functions.
		Multi-Step	Up to 17 Speeds can be set including Jog by Programmable Digital Inputs.
		Accel/Decel Time and Presets	0.00- 600.00/0.0- 6000.0 seconds. Three ACC/DEC preset values switched by digital inputs or one by frequency. Additional adjustable Accel/Decel S-Curve pattern.
		Emergency Stop	Ext. Trip and Shutdown immediately interrupt VFD output in any control method.
		Jog	Jog operation with adjustable Jog frequency.
		Fault Reset	Resets VFD faults via keypad, digital input or communication. Some critical faults can only be reset by cycling the VFD power.
		Safety Inputs	SCM and STO terminals for safety circuit wiring.
	Outputs	Three Multi-Function Relays	One relay with **Form C**: 250VAC 3A/30VDC 3A contact; Two relays with **Form A:** 250VAC 1.2A/30VDC 3A. Each relay can be programmed to any selection from the functions list.
		Two Analog Outputs	**Selections:** Output Frequency, Output Current, Output Voltage, Output kW, DC Link Voltage, V1 or I input signal level. Both outputs are 0-10VDC scalable from 10 to 200%.
	General Operation Functions		DC Braking, Frequency Limit, Jump Frequencies, 2nd ACC/DEC, Auto Restart, Auto-Tuning, PID w/sleep, Flying Start, Speed Search, DC Braking, Slip Compensation, Motor Pre-heat, Temperature Foldback, Damper Control, Fireman's Override, Shutdown, etc.
	Pump Operation Functions/Protections		Pipe Fill, 2nd PID, Trigger by AI, Overpressure, ULD (Underload), HLD (High Load), Dual Demand, Pipe Leak, Broken Pipe, MMC, Multi-VFD with Lead/Lag/Standby and Jokey, Transducer redundancy, Lubrication, Screen Clean, etc.
Protection	VFD Fault Trips		Over Voltage, Low Voltage, Over Current, Overload, Short Circuit, Ground Fault, VFD Overheat, Input Phase Loss, Output Phase Open, CPU Communication Error, Signal Loss, Hardware Fault, etc.
	Motor Overload		Adjustable electronic motor overload protection.
	Overcurrent		**200/208/230/460VAC Variable Torque:** At 200% of VFD rated current, **200/208/230/460VAC Constant Torque:** At 240% of VFD rated current, **Current clamp:** Variable Torque: 130- 135%, Constant Torque 170- 175% **575/690VAC models:** At 225% VFD rated current **Current clamp:** Variable Torque: 128- 141%, Constant Torque: 170- 175%
	Overvoltage		**230VAC models:** At 410VDC DC bus voltage **460VAC models:** At 820VDC DC bus voltage **575VAC models:** At 1016VDC DC bus voltage **690VAC models:** At 1189VDC DC bus voltage
	Overtemperature		Built-in IGBT and Capacitor Bank temperature sensors
	Restart After IPF		Adjustable power loss duration up to 20 sec. Leakage current is greater than 50% of rated current of the drive.
	VFD Alarm		Stall Prevention at ACC and DEC, Overload, Thermal Sensor Fault, Capacitors High Temperature, Signal Loss, Overpressure, Underload, High Load, etc.
Keypad Display	Operation Information		Output Frequency, Output Current, Output Voltage, Frequency Reference, Operating Speed, DC Voltage, kWattmeter, Run-time, Last Trip Time, Pressure, etc.
	Fault History		The VFD stores 5 last faults.
Environment	Operating Temperature		**NEMA 1:** 14°F - 104°F (-10°C - 40°C), **Open Type:** 14°F - 122°F (-10°C - 50°C)
	Storage Temperature		-13°F - 158°F (-25°C - 70°C)
	Ambient Humidity		Up to 95% RH. (Non-Condensing)
	Altitude		Normal up to 3,300ft (1,000m). At altitude up to 2,000 m, de-rate by 1% of rated current or lower 0.5 °C of temperature for every 100m above 1,000m. Maximum altitude for Corner Grounded TN system is 2,000m. For application over 2,000m, please contact FELE for more details.
	Vibration and Impact		1mm peak to peak value from 2Hz to 13.2Hz; 0.7G- 1.0G from 13.2Hz to 55Hz; 1.0G from 55Hz to 512Hz. Comply with IEC 60068-2-6 and IEC/EN60068-2-27.
	Environmental Conditions		Pollution degree 2. No Corrosive Gas, Combustible Gas, Oil Mist or Dust. IEC60721-3-3/ IEC60364-1/ IEC60664-1

Inputr Efficiency (>=X%)	**Drive Frame**	**Frame A**	**Frame B**	**Frame C**	**Frame D0**	**Frame D**	**Frame E**	**Frame F**	**Frame G**	**Frame H**
Input Voltage	**200/208/230VAC**	96	96.5	96.5	-	97	97	-	-	-
	460VAC	96	96.5	96.5	97	97	97	97	97.5	97.5
	575VAC	97	98	97	-	97	97	97	98	98

CERUS® X-DRIVE COOLING TOWER CONTROLLER

DIMENSIONS (UL TYPE 1)

200/208/230VAC Part Number	H x W x D
CTP1-BYP001-2V-3	57.6" x 12.5" x 13.0"
CTP1-BYP002-2V-3	
CTP1-BYP003-2V-3	
CTP1-BYP005-2V-3	
CTP1-BYP007-2V-3	
CTP1-BYP010-2V-3	
CTP1-BYP015-2V-3	
CTP1-BYP020-2V-3	62.0" x 18.8" x 14.9"
CTP1-BYP025-2V-3	
CTP1-BYP030-2V-3	
CTP1-BYP040-2V-3	

460VAC Part Number	H x W x D
CTP1-BYP001-4V-3	57.6" x 12.5" x 13.0"
CTP1-BYP002-4V-3	
CTP1-BYP003-4V-3	
CTP1-BYP005-4V-3	
CTP1-BYP007-4V-3	
CTP1-BYP010-4V-3	
CTP1-BYP015-4V-3	
CTP1-BYP020-4V-3	
CTP1-BYP025-4V-3	
CTP1-BYP030-4V-3	62.0" x 18.8" x 14.9"
CTP1-BYP040-4V-3	
CTP1-BYP050-4V-3	

DIMENSIONS (UL TYPE 3R)

200/208/230VAC Part Number	H x W x D
CTP3R-BYP001-2V-3	36.5"x 26" x 16.5"
CTP3R-BYP002-2V-3	
CTP3R-BYP003-2V-3	
CTP3R-BYP005-2V-3	
CTP3R-BYP007-2V-3	
CTP3R-BYP010-2V-3	41.5" x 29" x 16.56"
CTP3R-BYP015-2V-3	
CTP3R-BYP020-2V-3	
CTP3R-BYP025-2V-3	46.5" x 29" x 16.56"
CTP3R-BYP030-2V-3	51.5" x 34" x 20.6"
CTP3R-BYP040-2V-3	56.5" x 39" x 20.6"

460VAC Part Number	H x W x D
CTP3R-BYP001-4V-3	36.5"x 26" x 16.5"
CTP3R-BYP002-4V-3	
CTP3R-BYP003-4V-3	
CTP3R-BYP005-4V-3	
CTP3R-BYP007-4V-3	
CTP3R-BYP010-4V-3	41.5" x 29" x 16.56"
CTP3R-BYP015-4V-3	
CTP3R-BYP020-4V-3	
CTP3R-BYP025-4V-3	46.5" x 29" x 16.56"
CTP3R-BYP030-4V-3	51.5" x 34" x 20.6"
CTP3R-BYP040-4V-3	
CTP3R-BYP050-4V-3	
CTP3R-BYP060-4V-3	
CTP3R-BYP075-4V-3	56.5" x 39" x 20.6"
CTP3R-BYP100-4V-3	67x36x16
CTP3R-BYP125-4V-3	63.0" x 60.0" x 25.0"
CTP3R-BYP150-4V-3	

Franklin Electric