

FREQUENCY INVERTERS

■
Product Range
and
Technical Specification



COMPACT GENERAL PURPOSE FREQUENCY INVERTER WITH VECTOR CONTROL

Product Range

Model	Input voltage (V)	Rated output power (kW)	Output current (A)	Input current (A)	Overload capacity (60 sec) (A)	Applicable motor (kW)
ADV 0.40 C220-M	1 phase 220V (-15...+20 %)	0.4	2.3	5.4	3.45	0.4
ADV 0.75 C220-M		0.75	4.0	8.2	6	0.75
ADV 1.50 C220-M		1.5	7.0	14.0	10.5	1.5
ADV 0.75 C420-M	3 phase 380V (-15...+20 %)	0.75	2.1	3.4	3.15	0.75
ADV 1.50 C420-M		1.5	3.8	5.0	5.7	1.5
ADV 2.20 C420-M		2.2	5.1	6.2	7.65	2.2

Compact size frequency inverters

Designed for general purpose applications these compact sized frequency inverters with wide range of functions offer the most economically balanced solution for control of small capacity induction motors. C220/C420 series vector control frequency inverters are simultaneously sophisticated and easy to use products.

Enhanced Control and Performance

- Starting torque: 180% at 0.5Hz
- Two control modes: V/F and sensor less vector control
- Precise speed control stability: open loop magnetic flux vector control $\leq \pm 0.5\%$ (rated sync-speed)
- Improved speed control stability: open loop magnetic flux vector control $\leq \pm 0.3\%$ (rated sync-speed)
- Faster torque response time: ≤ 40 ms (with open loop magnetic flux vector control)
- Overload capacity: 150% of rated current during 60 sec; 180% of rated current during 3 sec
- Operating using sequence diagram. Sequence diagram control function: 16 independent timing cycles set by user



Built-in RS-485 interface (with Modbus protocol)

C220/C420 series frequency inverters have RS-485 interface with Modbus RTU protocol as a standard option.

Built-in brake unit

All frequency inverters of C220/C420 series are equipped with built-in brake unit that allows connecting an external braking resistor. This option allows using inverters in electric drive systems and machinery that require fast braking capability.

PID Control Option

Permits motor operation while controlling temperature, pressure and flow rate without the use of a temperature controller or other external device. PID control makes comparison of set signal (setting, desired value) with the feedback signal from sensors. By this means it detects mismatch or difference between set value and actual value.

Built-in Programmable Logic Controller

When manufacturing or operation process is organized as a sequence of actions or moves, it is worthy to use such an important build in option as simple Programmable Logic Controller for wide range of tasks. PLC option allows using or customizes frequency inverter in to a simple stand-alone automation system without using additional external equipment.

Protection options and functions

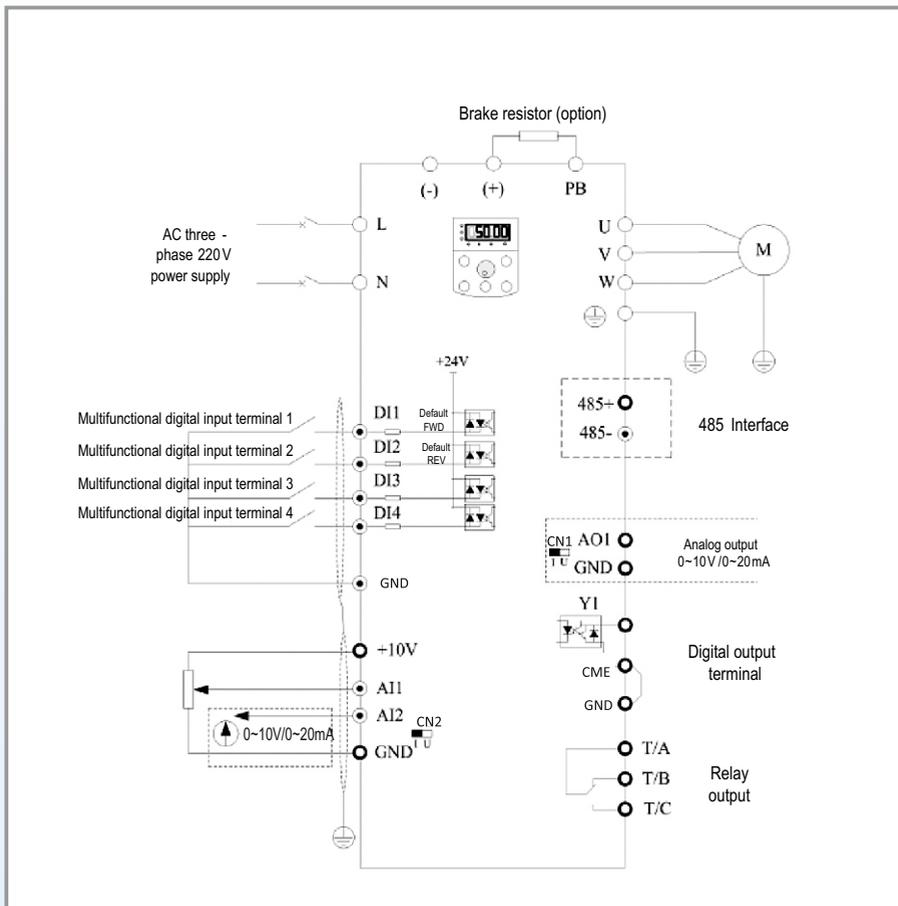
- Power-on motor short-circuit detection
- Input or output phase loss protection
- Over current or over voltage protection
- Under voltage protection
- Overheating protection
- Overload protection, etc.

Specification

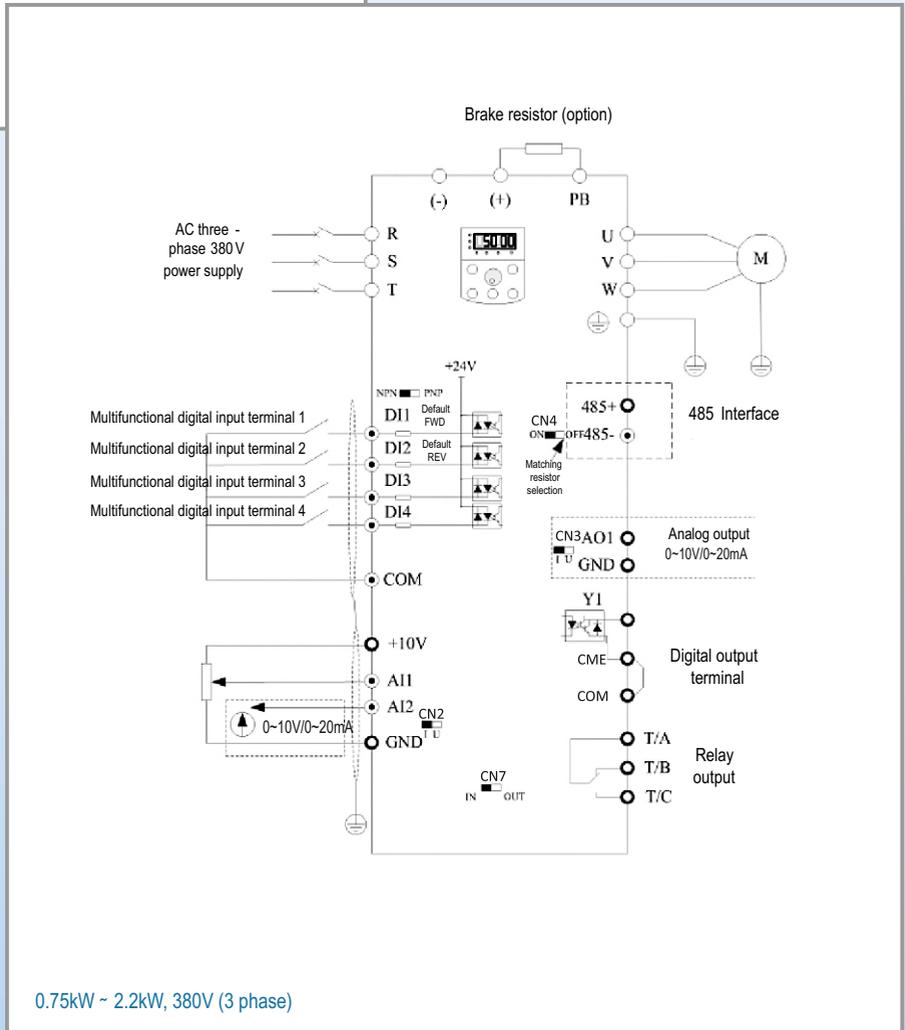
	Items	C220/C420 Series
	Power range	0.4 kW ~ 2.2 kW
Power supply	Rated voltage	C220: 220 V (1 phase) 50/60 Hz C420: 380 V (3 phase) 50/60 Hz
	Voltage range	-15% ...+20% of rated voltage
Control mode		V/f control, Vector flux control 1, Vector flux control 2
Basic functions	Maximum frequency	400.00 Hz
	Input frequency resolution	Digital setting: 0.01 Hz, Analog setting: 0.1% of max output frequency
	Carrier frequency	1-15 kHz; the carrier frequency will be automatically adjusted according to the load characteristics
	Starting torque	0.5 Hz/180% (open loop vector flux control)
	Torque hoist	Automatic torque hoist, Manual torque hoist 0.1~30.0%
	Speed adjustment range	1:200 (open loop vector flux control)
	Torque response	≤40ms (open loop vector flux control)
	Multi speed	16 segments speed (running via the simple PLC or control terminal)
	V/f curve	Linear V/f, Square V/f, Multi-point V/f
	Speed-up and Speed-down curve	Straight line or S curve speed-up and speed-down mode; two kinds of speed-up and speed-down time
	Acceleration/deceleration time	0.0~3000 sec
	DC brake	DC brake frequency: 0.00~400.00 Hz, Brake time: 0.0~36.0 sec, Brake current value: 0.0~100.0%
	Jog control	Jog frequency range: 0.00~50.00 Hz, Jog speed-up/speed-down time: 0.0~3000.0 sec
	PID control	Built-in
	Interface RS-485	Standard RS-485 communication function (MODBUS)
Auto voltage regulation (AVR)	It can keep constant output voltage automatically in case of change of mains voltage	
Inputs	Analog	2
	Digital	4
Outputs	Analog	1
	Digital	1
	Relay	1
Protection/ Warning function	Overload	150%, 60 sec
	Over voltage	Yes
	Under voltage	Yes
	Other protections	Overload, Overheat, Short circuit, Over current, Phase loss protection (input/output), etc.
Environment	Ambient temperature	-10 °C ... +40 °C (derated when used in ambient temperature of +40 °C...+50 °C)
	Ambient humidity	Max. 95 % (non-condensing)
	Altitude	Lower than 1000 m
	Vibration	< 5.9 m/c ² (0.6 G)
Structure	Protective	IP20

Basic Wiring Diagram

ADV 0.4 C220-M - ADV 1.5 C220-M



0.4kW - 1.5kW, 200V (1 phase)



0.75kW - 2.2kW, 380V (3 phase)

ADV 0.75 C420-M - ADV 2.2 C420-M

MULTI - PURPOSE VECTOR CONTROLLED FREQUENCY INVERTER WITH TWO DRIVE MODES

Product Range

Model	Input voltage (V)	Rated output power (kW)*	Output current (A)	Input current (A)	Overload capacity (60 sec) (A)	Applicable motor (kW)
ADV 1.50 M420-M	3 phase 380V (-15...+20 %)	1.5/0.75	3.8/2.1	5/3.4	4.94/3.78	1.5/0.75
ADV 2.20 M420-M		2.2/1.5	5.1/3.8	5.8/5	6.63/6.84	2.2/1.5
ADV 4.00 M420-M		4/2.2	9/5.1	10.5/5.8	11.7/9.18	4/2.2
ADV 5.50 M420-M		5.5/4	13/9	14.6/10.5	16.9/16.2	5.5/4
ADV 7.50 M420-M		7.5/5.5	17/13	20.5/14.6	22.1/23.4	7.5/5.5
ADV 11.0 M420-M		11/7.5	25/20	26/22	32.5/36	11/7.5
ADV 15.0 M420-M		15/11	32/25	35/26	41.6/45	15/11
ADV 18.5 M420-M		18.5/15	37/32	38.5/35	48.1/57.6	18.5/15
ADV 22.0 M420-M		22/18.5	45/37	46.5/38.5	58.5/66.6	22/18.5
ADV 30.0 M420-M		30/22	60/45	62/46.5	78/81	30/22
ADV 37.0 M420-M		37/30	75/60	76/62	97.5/108	37/30
ADV 45.0 M420-M		45/37	90/75	92/76	117/135	45/37
ADV 55.0 M420-M		55/45	110/90	113/92	143/162	55/45
ADV 75.0 M420-M		75/55	152/110	157/113	197.6/198	75/55
ADV 90.0 M420-M		90/75	176/152	180/157	228.8/273.6	90/75
ADV 110 M420-M		110/90	210/176	214/180	273/316.8	110/90
ADV 132 M420-M		132/110	253/210	256/214	328.9/378	132/90
ADV 160 M420-M		160/132	304/253	307/256	395.2/455.4	160/132
ADV 185 M420-M		185/160	340/304	345/307	442/547.2	185/160
ADV 200 M420-M		200/185	380/340	385/345	494/612	200/185
ADV 220 M420-M		220/200	426/380	430/385	553.8/684	220/200
ADV 250 M420-M		250/220	465/426	468/430	604.5/766.8	250/220
ADV 280 M420-M		280/250	520/465	525/468	676/837	280/250
ADV 315 M420-M		315/280	585/520	590/525	760.5/936	315/280
ADV 355 M420-M		355/315	650/585	665/590	845/1053	355/315
ADV 400 M420-M		400/355	725/650	785/665	942.5/1170	400/355
ADV 450 M420-M		450/400	820/725	883/785	1066/1305	450/400
ADV 500 M420-M		500/450	900/820	920/883	1170/1476	500/450
ADV 550 M420-M	550/500	1000/900	1020/920	1300/1620	550/500	
ADV 630 M420-M	630/550	1100/1000	1120/1020	1430/1800	630/550	

Enhanced Control and Performance

*normal duty/heavy duty

- Starting torque: 180% at 0.5Hz (heavy duty mode); 120% at 0.5Hz (normal duty mode)
- Two methods of control: V/F curve control and vector control with open loop
- Precise speed control stability: open loop magnetic flux vector control $\leq \pm 0.5\%$ (rated sync-speed)
- Improved speed control stability: open loop magnetic flux vector control $\leq \pm 0.3$ (rated sync-speed)

Switchable Dual Rating Operation Mode: Normal Duty / Heavy Duty

This option allows user to selected and appropriate operating mode of frequency inverter that corresponds to load of induction motor. "Normal Duty" is an operation mode optimized for lighter type of loads such as pumping and ventilation applications. Overload capacity in "Normal Duty" mode is 150% for 3 sec and 130% for 60 sec. Capacity on continuous operation corresponds to inverter rated capacity. "Heavy Duty" mode is designed for heavy work applications. Capacity on continuous operation is one step down from inverter rated capacity. For this mode overload capacity is 180% for 3 sec and 150% for 60 sec.



Various functions

- Built-in Programmable Logic Controller
- PID Control Option
- Multi speed control with 16 step frequency selection

Protection of environment

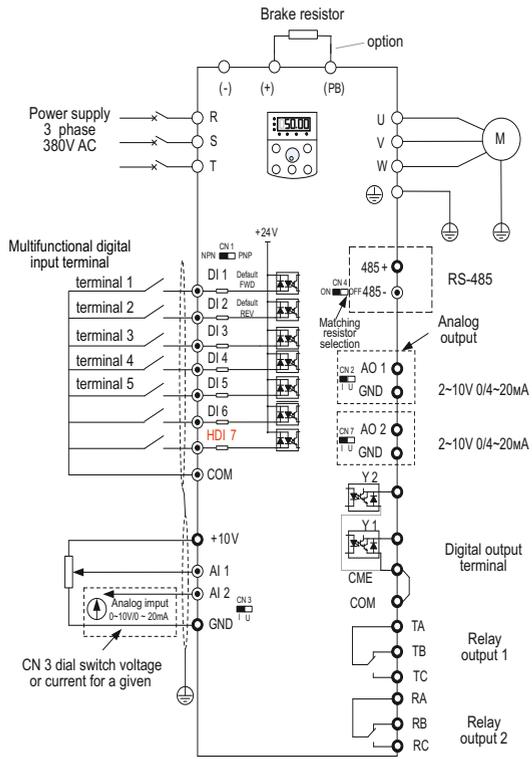
- Environmentally oriented design
- Improved ecological characteristics

Specification

	Items	M420 Series
	Power range	M420: 1.50 kW ~ 630 kW (normal duty) 0.75 kW ~ 550 kW (heavy duty)
Power supply	Rated voltage, frequency	380 V (3 phase) 50/60 Hz
	Voltage range	-15%...+20% of rated voltage
Control method		V/f control, Vector flux control
Basic function	Maximum frequency	600.00 Hz
	Input frequency resolution	Digital setting: 0.01 Hz, Analog setting: 0.1% of max output frequency
	Carrier frequency	1-15 kHz; the carrier frequency will be automatically adjusted according to the load characteristics
	Startup torque	0.5 Hz/120% (normal duty) 0.5 Hz/180% (heavy duty)
	Torque hoist	Automatic torque hoist, Manual torque hoist 0.1~30.0%
	Speed adjustment range	1:200 (open loop vector flux control)
	Torque response	≤40 ms (open magnetic flux vector control)
	Multi speed	16 segments speed (running via the simple PLC or control terminal)
	V/f curve	Linear V/f, Square V/f, Multi-point V/f
	Speed-up and Speed-down curve	Straight line or S curve speed-up and speed-down mode; two kinds of speed-up and speed-down time
	Acceleration/deceleration time	0.0~3000 sec
	DC brake	DC brake frequency: 0.00~400.00 Hz, Brake time: 0.0~36.0 sec, Brake current value: 0.0~100.0%
	Jog control	Jog frequency range: 0.00~50.00 Hz, Jog speed-up/speed-down time: 0.0~3000.0 sec
	PID control	Built-in
	RS-485 Interface	Standard RS-485 communication function (MODBUS)
Auto voltage regulation (AVR)	It can keep constant output voltage automatically in case of change of mains voltage	
Input	Analog	2
	Digital	5
Output	Analog	1
	Digital	1
	Relay	2
Protection/ Warning function	Overload	150%, 3 sec (normal duty), 180%, 3 sec (heavy duty)
	Over voltage	Yes
	Under voltage	Yes
	Other protections	Overheat, Short circuit, Over current, Phase loss protection (input/output), etc.
	Ambient temperature	10 °C ... +40 °C (derated when used in ambient temperature of +40 °C...+50 °C)
	Ambient humidity	Max. 95 % (non-condensing)
	Altitude	Lower than 1000 m
	Vibration	Max. 0.6 G
	Protective	IP20

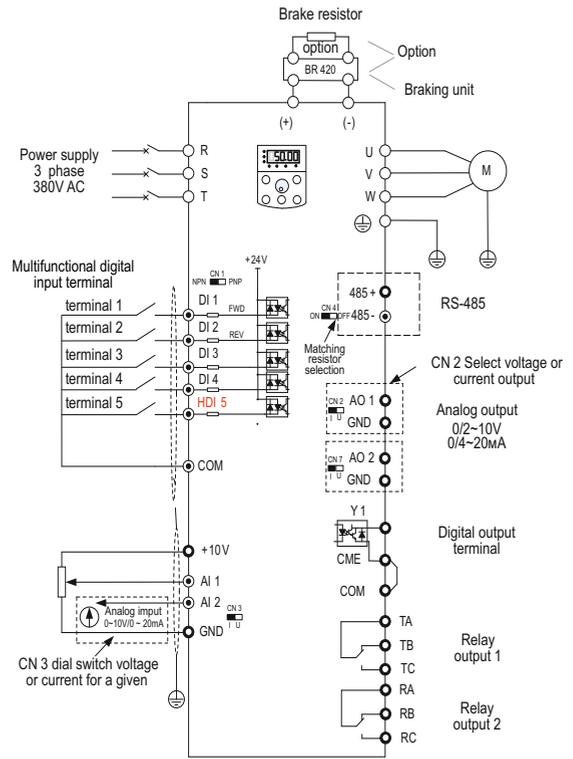
Basis Wiring Diagram

ADV 1.5 M420-M - ADV 18.5 M420-M



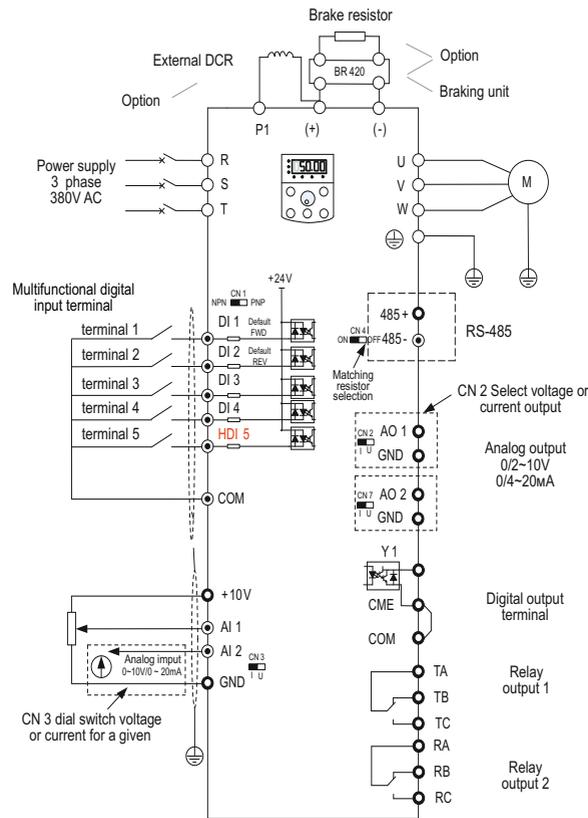
1.5kW - 18.5kW, 380V (3 phase)

ADV 22 M420-M - ADV 75 M420-M



22kW - 75kW, 380V (3 phase)

ADV 90 M420-M - ADV 630 M420-M



90kW - 630kW, 380V (3 phase)



Advanced Control[®], Advanced Systems Baltic OÜ

Punane 73, 13619 Tallinn, Estonia
Phone: +372 622 82 20, Fax: +372 622 82 21
Web: www.advcontrol.eu, e-mail: info@advcontrol.eu

Your regional representative

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