AXPERT VT240S

The World's Most Advanced Universal AC Drive

Features

- **6 control modes**
  - V/f variable torque control
  - V/f constant torque control
  - Sensor-less vector control
  - Closed-loop vector control
  - Sensorl-ess PM motor control
  - Closed-loop PM motor control
- **Intelligent**
  - User-programmable built-in PLC
  - Application-specific features
    - PID control
    - Multi-pump control
    - Traverse control for fibre machines
    - Auxiliary motor control up to 5 motors
    - Spinning ring frame
    - Energy optimiser
    - Elevator program
- **Environment-friendly**
  - RoHS Directive compliant
  - Selectable Soft-sound switching frequency
  - High-efficiency operation
  - Dioxin-free plastic cases
- **Global Design**
  - UL, cUL and CE compliant
  - Fieldbus interfaces (Modbus, Profibus-DP, DeviceNet, CANopen, CC_Link)
  - LED display as standard
  - Multi-language LCD monitor as option
  - Safe Torque OFF (STO) function
  - Engineered System with various options

AMTECH
AMTECH ELECTRONICS (INDIA) LTD.
DRIVE FOR SUCCESS

AN ISO 9001 : 2015 COMPANY

Model Number

AXPERT - VT240S - 2 P 2 H B F 2 0 0 0 S

Input voltage and capacity
- L: 200V Series
- H: 400V Series

Main circuit option 1
- A: Standard 1 (no options)
- B: Standard 1 with dynamic braking resistor
- D: DC input
- E: Standard 2 Enhanced (no options) (TP5H~37H)
- V: Standard 2 with dynamic braking resistor

Main circuit option 2
- 0: Standard
- F: Bilt-in EMC filter (Up to 5P5L/30H)
- R: Bilt-in DC Reactor (022L/037H and above)

Operation panel selection.
- 0: None
- 1: LCD type (V24-OP1)
- 2: LED type (V24-OP2) (Standard)
- 3: Chinese LCD type (V24-OP3)
- 4: High-resolution LCD type (V24-OP1A)

Control PCB option.
000 indicates no option

STO identification symbol.
- None: STO not provided
- S : STO provided

Standard Specifications

200V Series

Item		Specifications												
System		200V Series												
Type (AXPERT-VT240S □□□□)		0P7L	1P5L	2P2L	4P0L	5P5L	7P5L	011L	015L	018L	022L	030L	037L	045L
Equipment Rating	Normal Duty: Rated Capacity [HP] ❖1	1	2	3	5	7.5	10	15	20	25	30	40	50	60
	Normal Duty: Max. Continuous rated current [A]❖2	5	8	11	16	24	33	46	61	76	88	118	146	174
	Normal Duty: Max. Applicable motor [kW]❖3	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45
	Normal Duty: Carrier Frequency❖4	Standard 4 kHz (soft sound) : Variable between 1 and 15kHz												
	Normal Duty: Overload current rating	120% for 1 minute 140% for 2.5 seconds												
	Heavy Duty: Rated Capacity [HP] ❖1	0.5	1	2	3	5	7.5	10	15	20	25	30	40	50
	Heavy Duty: Max. Continuous rated current [A]❖2	3	5	8	11	16	24	33	46	61	76	88	118	146
	Heavy Duty: Max. Applicable motor [kW]❖3	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37
	Heavy Duty: Carrier Frequency❖4	Standard 4kHz (soft sound) ; Variable between 1 and 15kHz												
	Heavy Duty: Overload current rating	150% for 1 minute 175% for 2.5 seconds												
Power Supply	Rated input voltage/frequency	200 to 240V ± 10% 50 or 60 Hz ± 5%							200 to 230V ± 10% 50 or 60 Hz ± 5%					
Output	Rated output voltage ❖5	200 to 240 V (Max.)							200 to 230 V (Max.)					
	Output frequency range	0.1 to 440 Hz												
Main circuit option	EMC filter	Built-in (Standard)						External (option)						
	DC reactor	External (option)									Built-in (option)			
	DBR control circuit	Built-in (Standard)									External (option)			
	DBR resistor	Built-in (option)							External (option)					
Construction	Installation system	Wall-mounted, Free-standing type (optional) for 022L and above												
	Protective enclosure	IP20									IP00 (standard)			
	Cooling method	Self-cooled	Forced air cooling											
	Operating Environment	Indoors, Operating ambient temperature :- 10 to 50°C (14 to 122°F), Relative humidity : 95%RH or less (without condensation) Altitude: 1000m (3300 ft) or less, Vibration: 4.9m/s^2 or less, From corrosive or explosive gases, steam, dust, oil mist, or cotton lint.												

400V Series

Item		Specifications													
System		400V Series													
Type (AXPERT-VT240S □□□□)		0P7H	1P5H	2P2H	4P0H	5P5H	7P5H	011H	015H	018H	022H	030H	037H	045H	055H
Equipment Rating	Normal Duty: Rated Capacity [HP] ❖1	1	2	3	5	7.5	10	15	20	25	30	40	50	60	100
	Normal Duty: Max. Continuous rated current [A]❖2	2.5	3.6	5.5	8.6	13	17	23	31	37	44	60	73	87	108
	Normal Duty: Max. Applicable motor [kW]❖3	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
	Normal Duty: Carrier Frequency❖4	Standard 4 kHz (soft sound) : Variable between 1 and 15kHz													
	Normal Duty: Overload current rating	120% for 1 minute 140% for 2.5 seconds													
	Heavy Duty: Rated Capacity [HP] ❖1	0.5	1	2	3	5	7.5	10	15	20	25	30	40	50	60
	Heavy Duty: Max. Continuous rated current [A]❖2	1.5	2.5	3.6	5.5	8.6	13	17	23	31	37	44	60	73	87
	Heavy Duty: Max. Applicable motor [kW]❖3	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45
	Heavy Duty: Carrier Frequency❖4	Standard 4kHz (soft sound) ; Variable between 1 and 15kHz													
	Heavy Duty: Overload current rating	150% for 1 minute 175% for 2.5 seconds													
Power Supply	Rated input voltage/frequency	380 to 480V ± 10% 50 or 60 Hz ± 5%													
Output	Rated output voltage ❖5	380 to 480 V (Max.)													
	Output frequency range	0.1 to 440Hz													
Main circuit option	EMC filter	Built-in (option)													
	DC Reactor	External (option)													
	DBR control circuit	Built-in (Standard)											External (option)		
	DBR resistor	Built-in (option)								External (option)					
Construction	Installation system	Wall-mounted Standard, Free-standing (option) 037H (37kW) and above.													
	Protective enclosure	IP20												IP00 STD	
	Cooling method	Self-cooled	Forced air cooling												
	Operating Environment	Indoors, Operating ambient temperature :- 10 to 50°C (14 to 122°F), Relative humidity : 95%RH or less (without condensation) Altitude: 1000m (3300 ft) or less, Vibration: 4.9m/s² or less, Freedom from corrosive or explosive gases, steam, dust, oil mist, or cotton lint.													

200V / 400V Series

Item			Specifications											
System			200V Series			400V Series								
Type (AXPERT-VT240S □□□□)			055L	075L	090L	075H	090H	110H	132H	160H	200H	250H	315H	400H	475H
Equipment Rating	Normal Duty	Rated Capacity [HP] ❖1	75	100	120	100	120	150	175	215	270	335	425	535	635
		Max. Continuous rated current [A]❖2	211	286	328	147	179	214	249	321	428	519	590	740	870
		Max. Applicable motor [kW]❖3	55	75	90	75	90	110	132	160	200	250	315	400	475
		Carrier Frequency❖4	Standard 4 kHz (soft sound) : Variable between 1 and 8kHz												
		Overload current rating	120% for 1 minute 140% for 2.5 seconds												
	Heavy Duty	Rated Capacity [HP]❖1	60	75	100	75	100	120	150	175	215	270	335	425	535
		Max. Continuous rated current [A]❖2	174	211	286	108	147	179	214	249	321	428	519	590	740
		Max. Applicable motor [kW]❖3	45	55	75	55	75	90	110	132	160	200	250	315	400
		Carrier Frequency❖4	Standard 4kHz (soft sound) ; Variable between 1 and 8kHz												
		Overload current rating	150% for 1 minute 175% for 2.5 seconds												
Power Supply		Rated input voltage/frequency	200 to 230V ± 10% 50 or 60 Hz ± 5%			380 to 480V +/-5%, 50 or 60 Hz ± 5%									
Output		Rated output voltage ❖5	200 to 230 V (Max.)			380 to 480 V (Max.)									
		Output frequency range	0.1 to 440Hz												
Main circuit option		EMC filter	External (option)												
		DBR control circuit	External (option)												
		DBR resistor	External (option)												
Construction		Installation system	Wall-mounted (standard) / Free-standing (option)												
		Protective enclosure	IP00 (standard), IP20 (option)												
		Cooling method	Forced air cooling												
		Operating Environment	Indoors, Operating ambient temperature :- 10 to 50°C (14 to 122°F), Relative humidity : 95%RH or less (without condensation) Altitude: 1000m (3300 ft) or less, Vibration: 4.9m/s² or less, Freedom from corrosive or explosive gases, steam, dust, oil mist, or cotton lint.												

Note : ❖ 1. The output voltage indicates the output capacity [HP] at 200V for the 200V series, and 400V for the 400V series.
❖ 2. Indicates the total effective value including the higher harmonics.
❖ 3. Indicates the case for the standard 4-pole squirrel cage motor.
❖ 4. If the carrier frequency exceeds 4kHz, the rated current must be reduced. Please ref. fig.1.
❖ 5. An output voltage exceeding the input voltage cannot be attained.
❖ 6. Any optional accessory will be provided at extra cost and to be specified in order clearly.

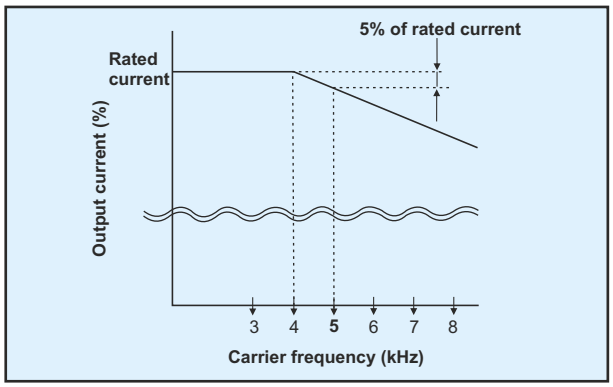


Fig. 1 Derating according to carrier frequency

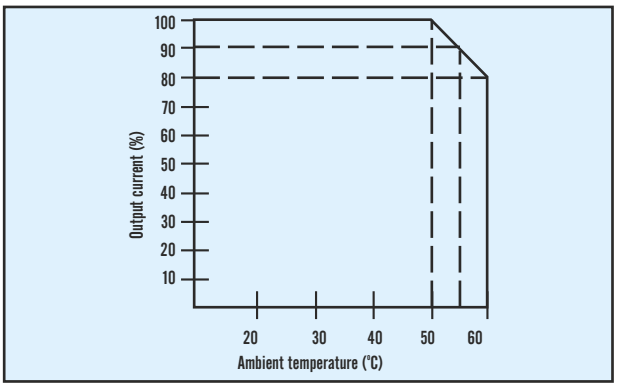


Fig. 2 Derating according to ambient temperature

LCD panel (V24-OP1) - Optional

LED panel (V24-OP2) - Standard

Control Specifications Table

		V/f control	Sensor-less vector control	Vector control with encoder ❖1	PM motor control with encoder ❖2
Frequency Control	Control Method	All digital control Sine wave approximation PWM			
	Transfer frequency	Mono-sound mode : 1 to 15 kHz (0.1 kHz increments) Soft sound mode : Average frequency 2.1 to 5kHz Frequency modulation method (3 tone modulation, 4 tone modulation)			
	Output frequency resolution	0.01 Hz			
	Frequency setting resolution	0.01 Hz (digital) 0.03% (analog) In respect to maximum frequency			
	Frequency accuracy	± 0.01% (digital) at 25 ± 10°C ± 0.0% (analog) at 25 ± 10°C			
Control specifications	Voltage/frequency Characteristics	Middle V/f point of five points randomly set between 3 and 440Hz can be set	Randomly set between 150 and 9999min^{-1} (max.180Hz)		Randomly set between 150 and 9999min^{-1} (max. 210 Hz)
	Torque boost	Manual / Automatic Selective	–		
	Max. torque boost	Max. torque for applicable motor is output when used with automatic tuning	–		
	Automatic tuning	Automatic measurement of motor constants Automatic measurement of various parameters Basic method which does not rotate motor, and extended method which rotates motor are available			Encode phase adjustment Magnetic pole position estimation
	Starting frequency	Set between 0.1 and 60.0 Hz	–		
	Starting torque	- At 200% or more using Amtech standard motor. (❖3) - Attainment time approx. 3 sec.	–		
	Acceleration / deceleration time	0.01 to 60,000 sec Acceleration/deceleration time x 2, jogging dedicated X1, program cushion x 8			
	Acceleration / deceleration mode	Linear/S-character selective			
	Operation method	3 mode selective - Forward run/revese run - Run stop/forward run reverse run - Forward run pulse/revese run pulse/stop			
	Stop method	Deceleration stop in respect to run, emergency stop and inching, coast to stop selective			
	DC Braking	Braking start frequency, randomly set between 0.1 and 60.0Hz Braking voltage, Randomly set between 0.1 & 20.0%	Braking start speed set between 0.00 and 50.00% Braking current set between 50 and 150%		
	Braking Time	Set between 0.0 and 20.0 seconds			
	Output frequency	0.1 to 440 Hz	0 to 180 Hz		0 to 210 Hz
	Control range	Simple ASR function is not specified	1 : 100	1 : 1000	1 : 100
	Constant output range	Up to 1 : 7	Up to 1 : 2	Up to 1 : 4	Up to 1 : 1.5
	Control accuracy (At Fmax ≥ 50Hz)	± 0.01%	± 0.5%	± 0.01%	± 0.01%
	Control response	Simple ASR function is not specified	5Hz	30Hz	–
Setting	Multi-step frequency Setting	8 steps Acceleration / Deceleration time as programmable 5-bit non-encode mode			

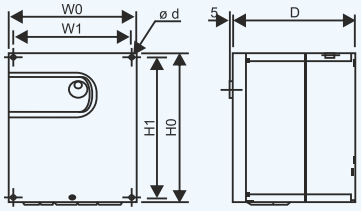
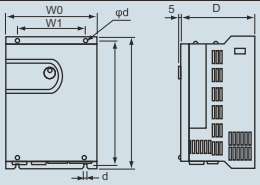
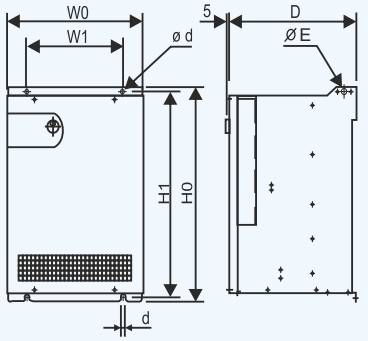
		V/f control	Sensor-less vector control	Vector control with encoder ❖1	PM motor control with encoder ❖2
Setting	Ratio interlock setting	During remote setting mode y=Ax+B+C y : Operation results x : Operation input A : 0.000 to ± 10.000 B : 0.00 to ± 440Hz C : Auxiliary input with output upper / lower limit	During remote setting mode y=Ax+B+C y : Operation results x : Operation input A : 0.000 to ± 10.000 B : 0 to ± 7200 min^{-1} (120Hz) C : Auxiliary input with output upper / lower limit		
	Skip Frequency	Three places can be set Width can be varied between 0.0 and 10Hz			
	Slip compensation	Operation/non selective Slip compensation gain : 0.0 to 20.0			
	Automatic run function	10-step automatic run function Synchronous / Asynchronous selective			
	Built-in PLC function	Arithmetic operations, logical operations, size comparison and LPF operations, etc., in respect to the sequence input/output and analog input/output are possible. Program capacity: max.64 commands *5 banks, operations cycle: 1 bank in 2ms			
	Others	PID Control Pick-up Automatic Start Restart after instantaneous power failure Reverse run prevention	Traverse pattern Deceleration control at power failure Multi-pump Spinning frame		
Control input/output	Operation panel	Local/remote changeover operation, forward run/reverse run direct operation, reference, change and copy of all parameters Mountable outside unit (extension cable max. 3m)			
	LCD type Optional	Display : 16 characters *2 lines Status display LED : 4 points Operation : Operate with knob and set key			
	LED type Standard	Display : 7-segment LED x 5 digits + sign Status/unit display LED : 7 points Operation : Operate with ▲▼ keys + set key			
	Sequence input	Programmable : 7 points sink/source changeable, PSI7 is used as pulse train input			
Control input/output	Sequence output	Relay 1c contact: 1 point (programmable), relay 1a contact : 1 point (programmable), open collector, 3 points (programmable), PS03 is used as pulse train output The programmable details can be changed between speed detection, pre-charging complete, reverse run, speed reached, direction operation, current reached, speed reached, acceleration, deceleration and fault code			
	Frequency setting	Voltage input (0 to 10V, 0 to 5V, 1 to 5V) or current input (4 to 20mA, 0 to 20mA) : 2 points Voltage input (0 to ±10V, 0 to ±5C, 1 to 5V): 1 point (used with sequential ratio operation or PID feedback etc) Pulse train input (max. 10kHz) : 1 point			
Control	Meter output	Voltage output (0 to 10V) or current output (4 to 20mA): 2 points (programmable) Change between output frequency, output voltage, output current, DC voltage, etc.			
Communication	Serial Interface	Communication protocol: Modbus-RTU or VT240S series dedicated communication (standard serial) Connection method: RS485, 2-wire type, Transmission distance: total extension distance 150m or less, Transmission method Start-stop synchronization, half-duplex communication, Baud rate: select from 4800/9600/14400/19200/38400bps, No.of stations: max.32 units, Error detection: Sum check parity, framing			
Protection	Preventive	Overcurrent limit (primary current limit level changeable in three stages), overcurrent limit, undervoltage limit, overload warning, carrier frequency automatic reduction at overload (cooling fin overheat) (selective)			
	Shut-off	Overcurrent, over voltage, under voltage, IGBT fault, phase failure (input/output), overload, cooling fin temperature rise, ground fault, other self-diagnosis			
	Fault history	Past four faults recorded. Recorded details: primary cause, secondary cause, output frequency/current/DC voltage before shutoff, hardware latch, cumulative ON time, cumulative operation time			
	Overload withstand level	Normal-duty setting 120% for 1 minute, 140% for 2.5 seconds (reduced to 60% for 1 munute from 1Hz to 0.1Hz) Inverse time characteristics Heavy-duty setting 150% for 1 minute, 175% for 2.5 seconds (reduced to 75% for 1minute from 1Hz to 0.1Hz). inverse time characteristics			
	Auto-Restart	Programmable between 0 and 10 times			

Note : ❖1. Encoder option PCB is required.

❖2. This is for the standard PM motor. The PM speed detection PCB is required.

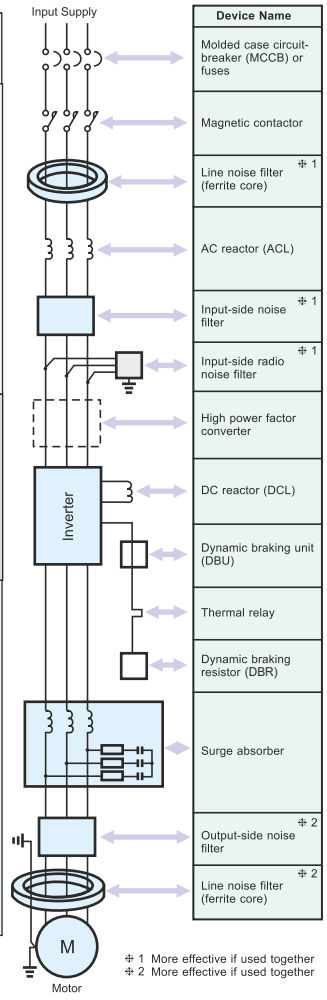
❖3. Differs according to the motor capacity, rated voltage and rated frequency. If 45kW is exeeded, starting torque is > 150%.

External Dimensions

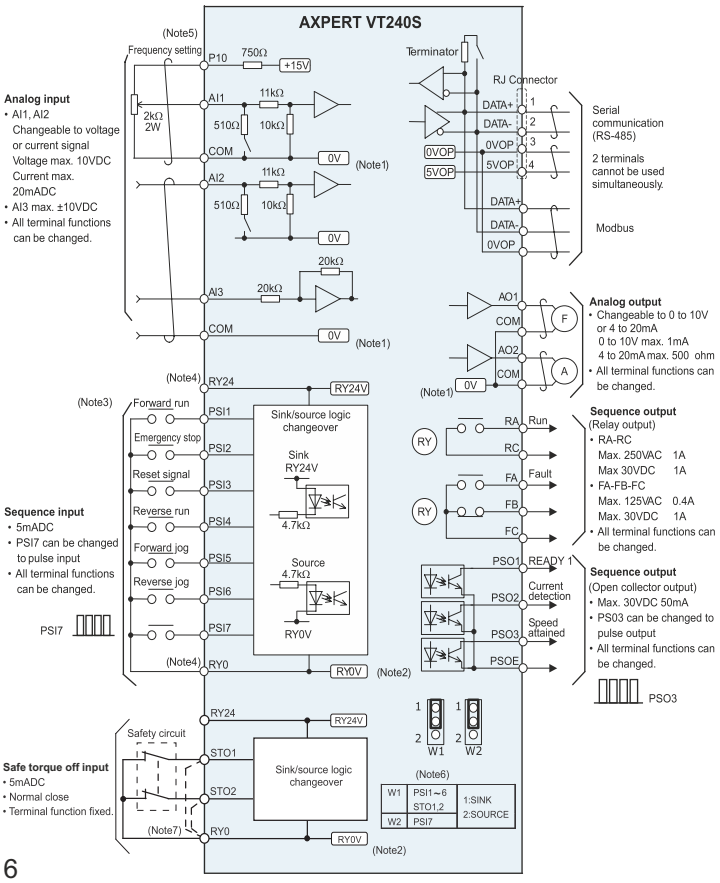
Type		Dimensions in mm (Inch)							Approx. weight kg(lb)	Wall Mounted Unit
200V	400V	W0	W1	H0	H1	D	φd	φE		
0P7L 1P5L 2P2L 4P0L 5P5L	0P7H 1P5H 2P2H 4P0H 5P5H	155 (6.10")	140 (5.51")	250 (9.84")	235 (9.25")	180 (7.09")	6 (0.24")	–	3 (6.6)	
7P5L 011L	7P5HA/HE 011HA/HE 015HA/HE	205 (8.07")	190 (7.48")	275 (10.83")	260 (10.24")	196 (7.72")	7 (0.28")		5 (11.0)	
015L 018L		260 (10.23")	240 (9.45")	350 (13.78")	330 (12.99")	298 (11.73")			12 (26.5)	
	018HE 022HE	235 (9.25")	175 (6.89")	330 (12.99")	312 (12.28")	189.5 (7.46")	7 (0.28")		10 (22.0)	
	030HE 037HE	260 (10.24")	200 (7.87")	350 (13.78")	335 (13.19")	195 (7.68")	7 (0.28")		11.5 (25.4)	
022L 030L	045H	300 (11.81")	200 (7.87")	470 (18.50")	450 (17.72")				23 (50.7)	
									27 (59.5)	
037L 045L		340 (13.38")	240 (9.44")	520 (24.47")	500 (19.69")	317 (12.48")	10 (0.39")	15 (0.59")	30 (66.1)	

Note: The above-mentioned dimensions are applicable when no DC reactor is mounted on the main unit. Please inquire for the dimensions with the DC reactor.

System

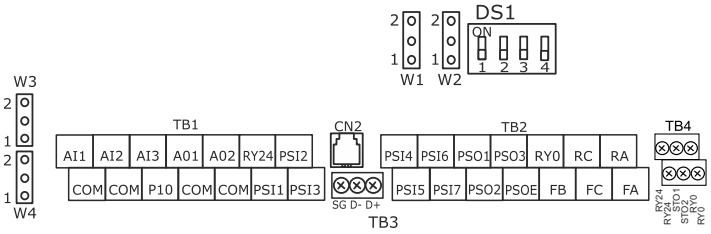


Connection and Terminals



Control terminal

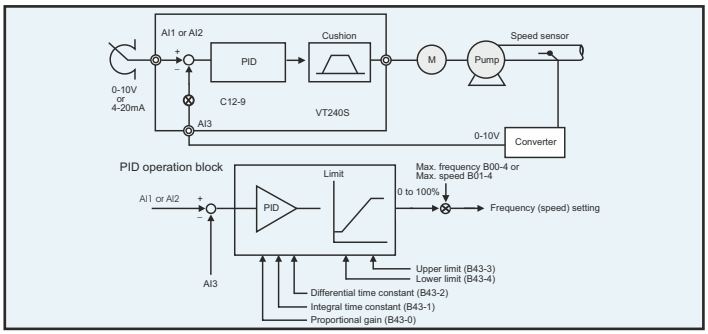
- The terminal block is laid out in two rows.
- Terminal screw size is M3.



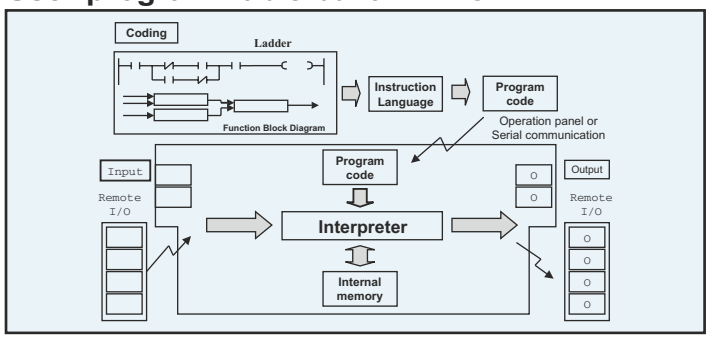
(Notes)

1. Four COM terminals are internally connected.
2. No connection shall be made between RY0, COM and 0VOP since this section is isolated.
3. This diagram is an example of the sink logic connection.
4. RY24 and RY0 must not be shorted.
5. P10 and COM must not be shorted.
6. Short-circuit plugs W1 and W2 are set to the 1 side (sink) as the default.
7. STO1 and STO2 are shorted with a short-circuit wire as the default. Remove this wire when connecting a safety circuit.

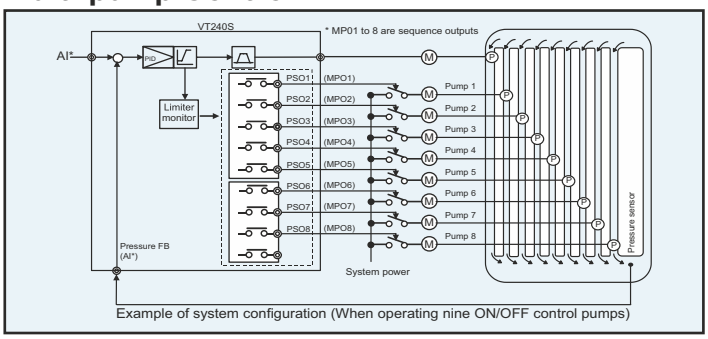
PID Control



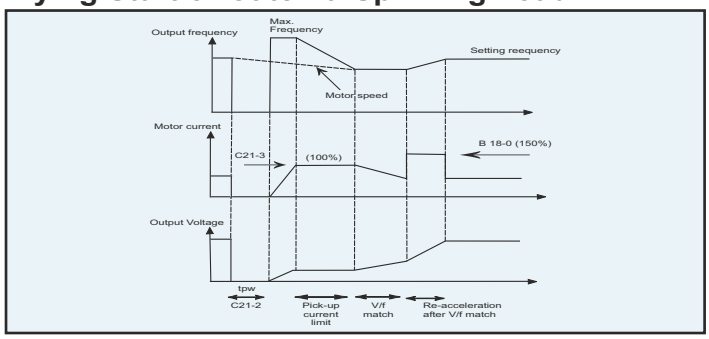
User-programmable built-in PLC



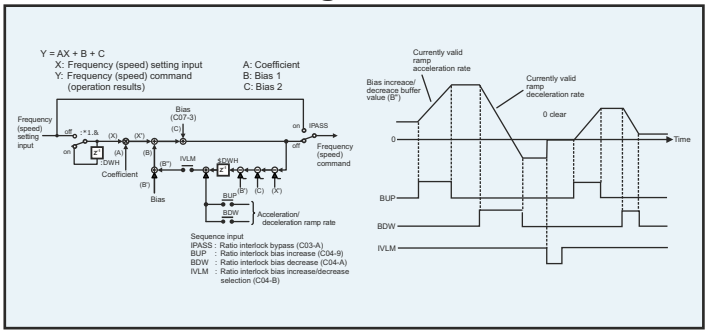
Multi-pump Control



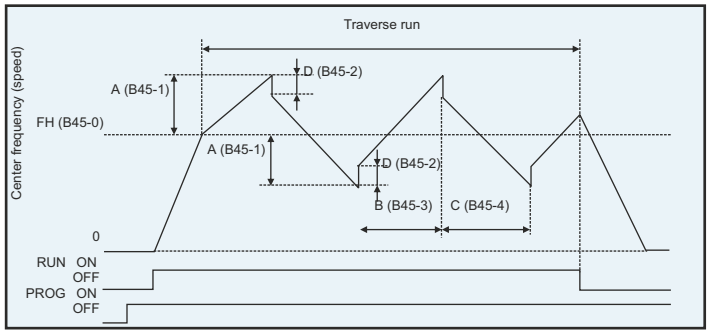
Flying Start or Catch-a-Spinning Load



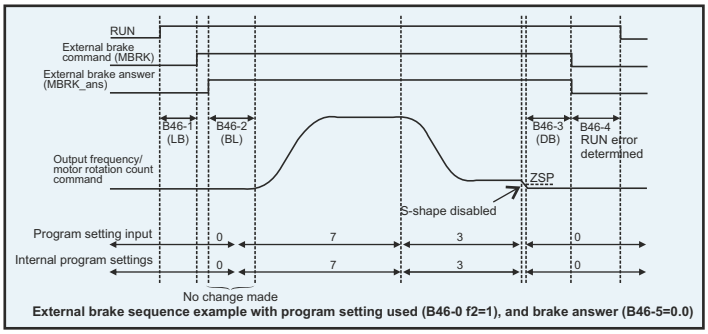
Ratio Interlock Setting



Traverse Run

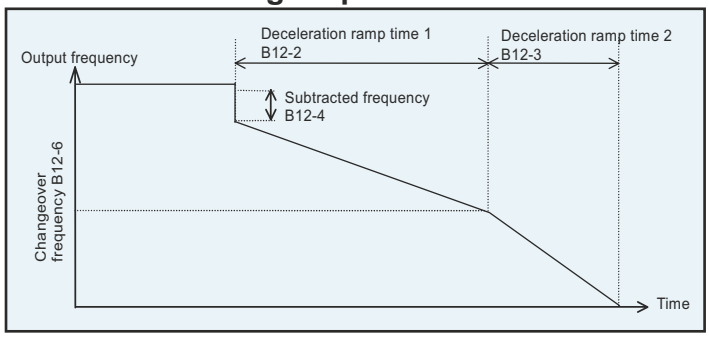


External Brake Control

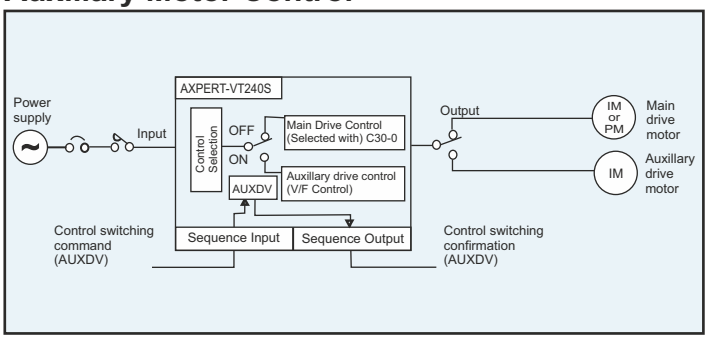


External brake sequence example with program setting used (B46-0 f2=1), and brake answer (B46-5=0.0)

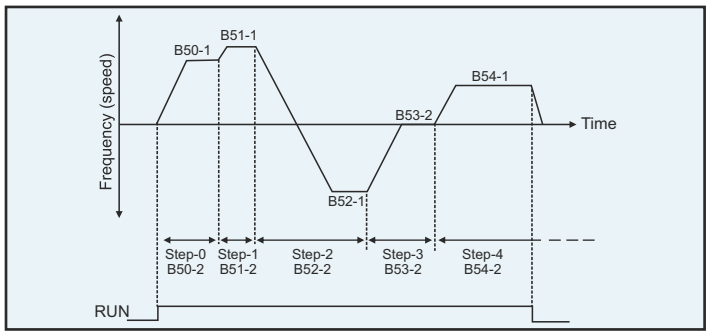
Automatic Braking on power failure function



Auxiliary Motor Control



Pattern run function



OUR OTHER OFFERINGS

MOTOR CONTROL

"DRIVE FOR SUCCESS"

We provide complete motor control system solutions or individual system components to address industry specific requirements and optimize your process.

Our solutions are simple, compatible and environment friendly, resulting in efficient production, cost optimization and minimizing human intervention. It even leads to energy conservation especially in typical Fan, Blower applications.

Flagship Solutions

- Axpert-Eazy+ Series VFD
- Axpert-VT240S Series VFD
- Axpert-Hivert Series Medium Voltage Drive
- Axpert-Opti torque Soft Starter
- Axpert-Eazy HF-High Frequency Drive

Applications

- Fans, Blowers, Pumps
- Compressors, Centrifuges
- Agitators & Conveyors
- Oil & Gas
- Mining

AUTOMATION

"AUTOMATION. MADE EASY"

"Automation Made Easy" is our philosophy to simplify the increasing complexity of modern production systems through our Amtech-Jetter PROCESS PLC technology platform.

Our 30 years experience in Machine, Line, Plant and Networking Automation has helped us to find the best solution in terms of functionality, sustainability and efficiency.

Flagship Solutions

Jet Control series PLC Controllers, Expansion Modules, Jet view Soft SCADA, HMIs, Jet Move series Servo and Axes Control System.

Applications

- Paper Machine Automation
- Textiles Manufacturing
- Packaging
- Winder Machine
- Crane & Material Handling Equipment
- CNC Machines
- Semiconductor Assembly Line
- Retrofit solutions

POWER QUALITY

"ONE STOP SOLUTION TO QUALITY POWER"

Amtech's Power Quality Solutions offer you the synergy of multiple benefits - energy conservation, enhanced operational efficiency and reliability through a dedicated range of products and services.

Products

- Active Front end Converter
- Active Harmonic Filter (AHF)
- Active Static VAR Compensator (STATCON)
- Static Harmonic Converter
- Harmonic Reactor
- Sinus Filter
- EMI/RFI Filter

Services

- Harmonic Audit and Solutions to comply with IEEE-519 standard
- System design, optimization & pay-back analysis
- Consultancy for Power Quality improvement
- Training on Power Quality Management
- Energy Audit and solutions by experienced BEE certified professionals

INDUSTRIAL ELECTRONICS

"YOUR TECHNOLOGY PARTNER"

Amtech's Power Electronics Engineering Services offer technology solutions to independent R&D labs, industrial segments like Traction, Oil & Gas, Automotive and Renewable Energy for wind and solar to reduce your time to market.

Products

- Traction Drive
- High Voltage Power Supply
- Battery back-up drive & systems for critical loads
- Wind Power Converter
- Grid tied Solar Inverter
- Digital Heater controller
- Batter charger
- Drive Train

Services

- Power Electronics Engineering Services
- Customized solutions for industry specific applications
- Solutions for Oil, Gas & Mining
- Power Electronics product development & testing
- Product verification & validation
- Retrofit Solutions

AMTECH

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DRIVE FOR SUCCESS

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