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Bharat Bijlee

BBVERT BL50N

AC Variable Frequency Drives

Compact Dimensions and Excellent Reliability

INTRODUCTION

Introducing the new BL50N of AC Variable Frequency Drives.

Bharat Bijlee, a pioneer in the electrical engineering space in India, has over 75 years of experience in the field of electric motors. Our product portfolio includes motors in the efficiency classes IE2 to IE5 as well as special purpose motors for servo applications, elevators, cranes, and for use in hazardous areas.

As awareness about global warming increases, there is a growing trend to use AC Variable Frequency Drives (VFDs) along with motors. In industry, VFDs are installed for a variety of reasons. VFDs offer precise positioning, allow users to smoothly regulate the running speed of motors, and also help improve energy efficiency of driven systems by matching motor speed and torque to suit the load.

To complement our range of high performance servo drives, made in partnership with KEB Automation of Germany, we now introduce the BL50N compact AC VFDs.

The BL50N drives are now available in ratings from 0.4kW to 1.5kW (single phase 230V) and 0.75kW to 15 kW (3 phase 400V).

BL50N is suitable for a wide variety of applications: fans, blowers, pumps, mixers, conveyors, textile machinery, packaging machinery, and many more. The BL50N range is available across the country through our Solution and Sales partners; and, as with all our products, it is supported by our centralized service desk and Pan-India service network.

BL50N AC VARIABLE FREQUENCY DRIVES

Power Ratings: 0.4kW to 1.5kW (Single Phase) 230V AC/50Hz/60Hz
0.75kW to 15kW (Three Phase) 415V AC/50Hz/60Hz

Salient Features

- Space Vector PWM-based Scalar Control Mode
- Automatic Current Limit
- Reduced Power Mode
- Detachable Keypad
- Automatic Voltage Regulation
- Energy Efficient Running
- Overload Capacity: 150% for 1 min.; 180% for 10 sec.; 200% for 1 sec. (HD)
- Drive Protection against over-voltage, under-voltage, over-temperature, overload, under-current, and short circuit
- LED Display: Display of drive parameters; running status; fault display
- Built-in RS 485 Modbus RTU Communication
- Built-in Counter
- V/F Mode: 4 preset modes and 1 user defined
- Multi-speed Running
- PI Control
- Operating Ambient Temperature 55°C
- I/Os for BL50N up to 2.2kW: Analog Input-1; Analog Output-1; Digital Input-5 nos; Digital Output-1; Relay Output-1
- I/Os for BL50N (3.75kW to 15kW): Analog Input-2; Analog Output-1; Digital Input-8 nos; Digital Output-2; Relay Output-2
- AC Input Choke: Optional (recommended for drive protection and THD reduction)
- IP20 Enclosure

APPLICATIONS


Fans


Pumps


Packaging Machines


Industrial Washing Machines


Conveyors


Chemical Mixers

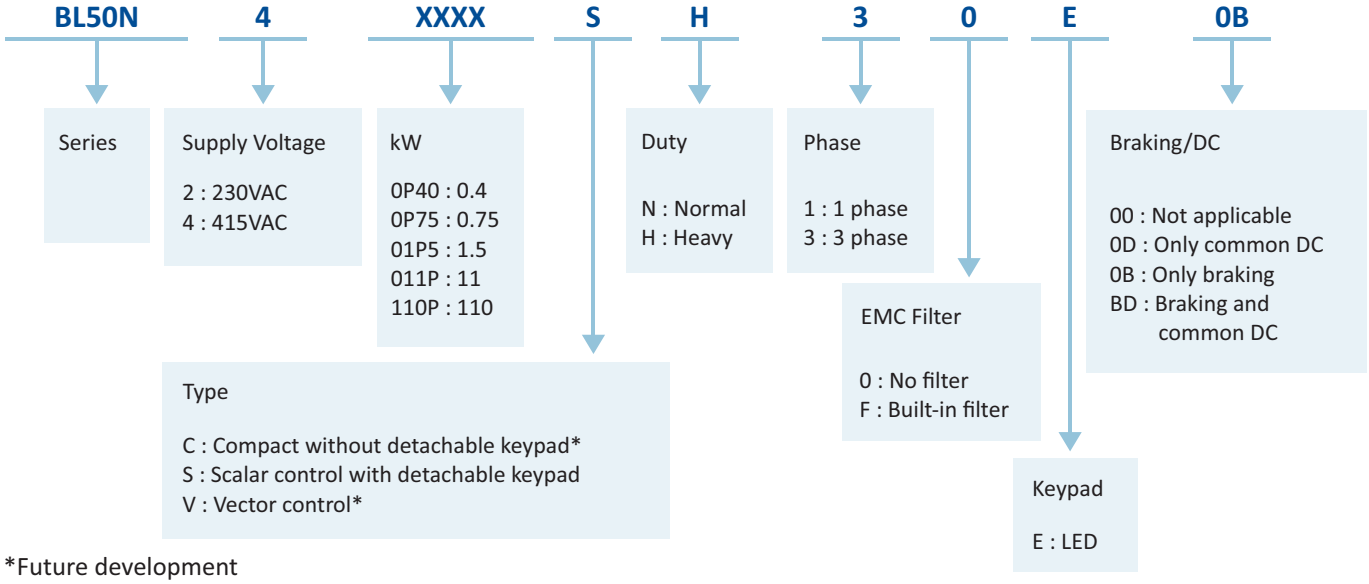

Textile Machines

TECHNICAL SPECIFICATIONS

Power Supply	Rated input voltage/frequency	0.4kW ~ 1.5kW single phase 230VAC 50Hz/60Hz, 0.75kW ~ 15kW 3 phase 415VAC 50Hz/60Hz
	Permissible voltage fluctuation	230V ±15% for 1 phase, 415VAC ±15% for 3 phase
	Permissible frequency fluctuation	±5%
Control Function	Control mode	Space vector PWM-based scalar control
	Frequency control range	0.1 ~ 400.0Hz
	Frequency accuracy	Digital setting 0.1%, analog instruction 0.1% (max frequency)
	Frequency resolution	Digital instruction 0.1Hz, analog instruction 0.1Hz
	Acceleration/Deceleration time	Four programmable Acceleration/Deceleration time ranging from 0.0 ~ 3600 sec.
	Multi-speed running	Built-in program using simple PLC feature
	Built-in PI	Process control with PI Function
	Built-in counter	Preset UP counter 0~65535 for controlling the production line
	Overload capacity	200% for 1 sec., 180% for 10 sec. and 150% for 60 sec. (For HD Rating) for every 10 min. 180% for 1 sec., 150% for 10 sec. and 120% for 60 sec. (For ND Rating) for every 10 min.
	V/F mode	4 preset V/F modes and 1 user-defined V/F program
	Energy efficient running	Changes the V/F curve according to the load to reduce energy consumption
	Automatic current limit	Handles behavior of drive during accelerating heavy inertia loads which in other cases would cause an over-current condition
	Reduced power mode	Continues operation even when the grid is below ideal voltage levels
	Automatic voltage regulation	Regulates voltage automatically whenever there is a change in grid voltage
Operation Function	Operation commands	Keypad, external terminals, external communication using MODBUS
	Frequency setting	Keypad up/down keys, Keypad digital potentiometer, external potentiometer, analog inputs (0-20mA/ 4-20mA/ 0-10V), MODBUS communication
	Input signal	0.4kW-2.2kW: 5 user selectable (PNP/NPN) multifunction inputs 3.75kW-15kW: 8 user selectable (PNP/NPN) multifunction inputs
	Output signal	0.4kW-2.2kW: 1 User selectable multifunction relay output (250V/5A contact), 1 User selectable multifunction open collector output 3.75kW-15kW: 2 User selectable multifunction relay output (250V/5A contact), 2 User selectable multifunction open collector output
Protection Function		0.4kW-2.2kW: over-current, over-voltage, under-voltage, over-temperature, overload, under-current, system error 3.75kW-15kW: over-current, over-voltage, under-voltage, over-temperature, overload, under-current, system error, short circuit
Display	Display parameter	Parameter setting, running status and fault display
	Display type	Removable keypad with 8 keys, 1 switch enabled rotatory functional navigator, 5x7 segment LED display and 7 status LEDs
External Communication	Protocol	MODBUS RTU over RS485 with a maximum baud rate of 115200
Operating Condition	Operating environment	Temperature: -10°C ~ +55°C, Humidity: < 90%, no condensation, IP20 indoor, <1000m altitude above sea level
	Storage temperature	-20°C ~ +60°C
	Vibration	<5.9m/s2 (0.6g)

NOMENCLATURE AND RATINGS

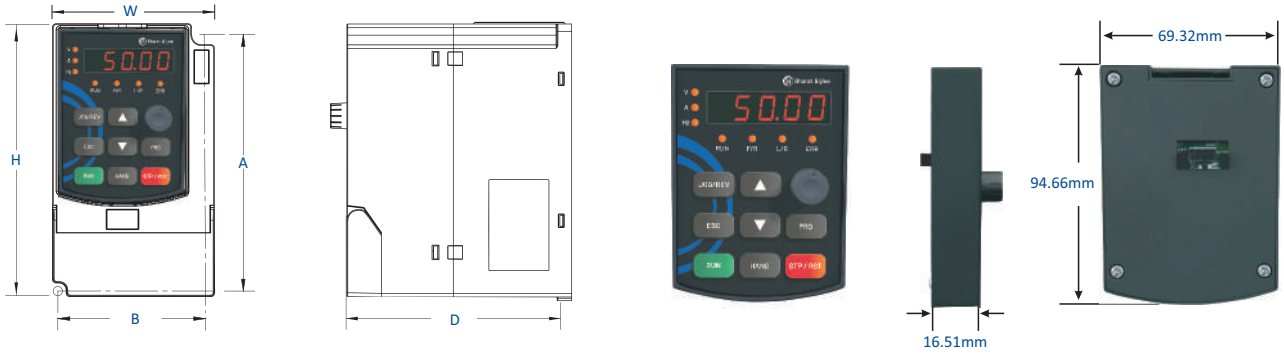
Unit Identification



*Future development

Power Supply	Frame	Model	Power (kW)	Output Current (HD/ND) (A)
1 Phase 230VAC	1	BL50N - 20P40 - SH10 - EXX	0.4	2.5/5
1 Phase 230VAC	1	BL50N - 20P75 - SH10 - EXX	0.75	5/7
1 Phase 230VAC	1	BL50N - 201P5 - SH10 - EXX	1.5	7/9
3 Phase 415VAC	1	BL50N - 40P75 - SH30 - EXX	0.75	1.8/3
3 Phase 415VAC	1	BL50N - 401P5 - SH30 - EXX	1.5	3/5
3 Phase 415VAC	1	BL50N - 402P2 - SH30 - EXX	2.2	5/7
3 Phase 415VAC	2	BL50N - 403P7 - SH30 - EXX	3.7	9/13
3 Phase 415VAC	2	BL50N - 405P5 - SH30 - EXX	5.5	13/17
3 Phase 415VAC	2	BL50N - 407P5 - SH30 - EXX	7.5	17/25
3 Phase 415VAC	3	BL50N - 4011P - SH30 - EXX	11	25/32
3 Phase 415VAC	3	BL50N - 4015P - SH30 - EXX	15	32/37

0.4kW TO 2.2kW RATINGS - DIMENSIONS



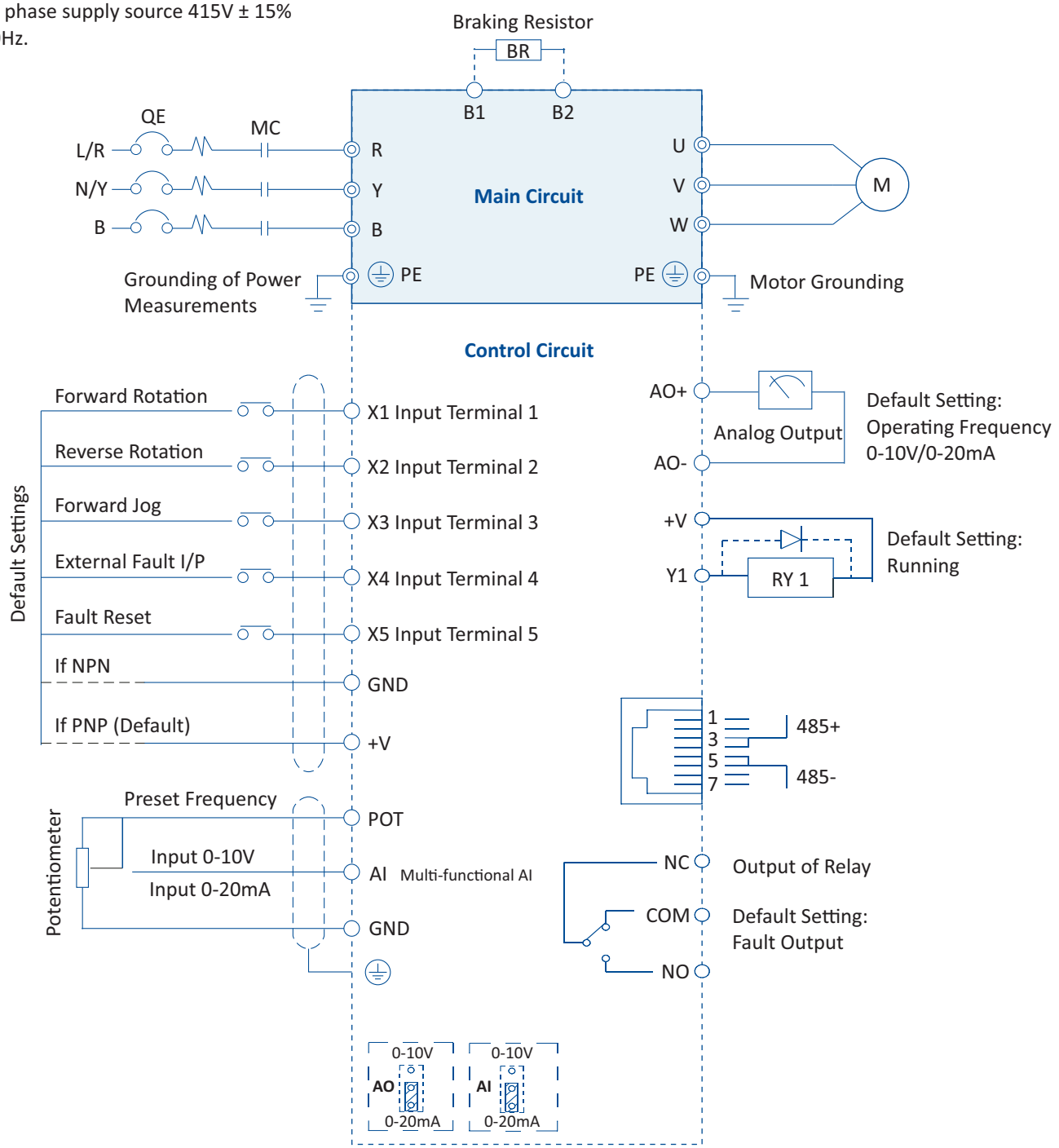
Model	Mounting Dimension		Dimension			Bore Dia.	Weight
	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	(mm)	(kg)
1 Phase 230V S Type Frame 1	141	80.5	150	89	123	4.6	0.85
3 Phase 415V S Type Frame 1							

Control Terminals

Class	Sign	Terminal Name	Terminal Instructions and Factory Preset
Multi-functional Inputs (NPN and PNP selectable from parameter configuration)	X1	Multifunction input terminal 1	Default: Forward run
	X2	Multifunction input terminal 2	Default: Reserve run
	X3	Multifunction input terminal 3	Default: Forward jog
	X4	Multifunction input terminal 4	Default: External fault input
	X5	Multifunction input terminal 5	Default: Fault reset
	GND	Common terminal	Multi-functional input common terminal and ground reference for +24V power supply terminal (to be used for inputs when in NPN mode)
Analog Input	POT	POT	Terminal for connecting 10k potentiometer
	AI	Analog input	0~10V input or 0~20mA (a switch for selection) (0/4~20mA through parameter selection)
	GND	Analog input ground	Analog input ground
Multi-functional Output	+V	+24V power supply	+24VDC / 30mA (it can be used for inputs when in PNP mode)
	Y1	Multifunction open collector O/P	24V / 50mA (sinking type) Default: Running status
	NO	Relay output	250V / 5A Contact Default: Fault output
	COM		
	NC		
Analog Output	AO+	Analog output + terminal	0~10V output or 0~20mA output (switch for selection) (0/4~20mA through software selection)
	AO-	Analog output - terminal	

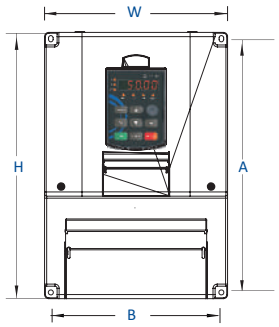
CONNECTION DIAGRAM (0.4kW TO 2.2kW)

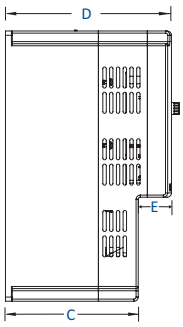
Single phase supply source 230V ± 15%
Three phase supply source 415V ± 15%
50/60Hz.



Note: PNP and NPN settings can be changed in P5-12.

3.75kW TO 15kW RATINGS - DIMENSIONS



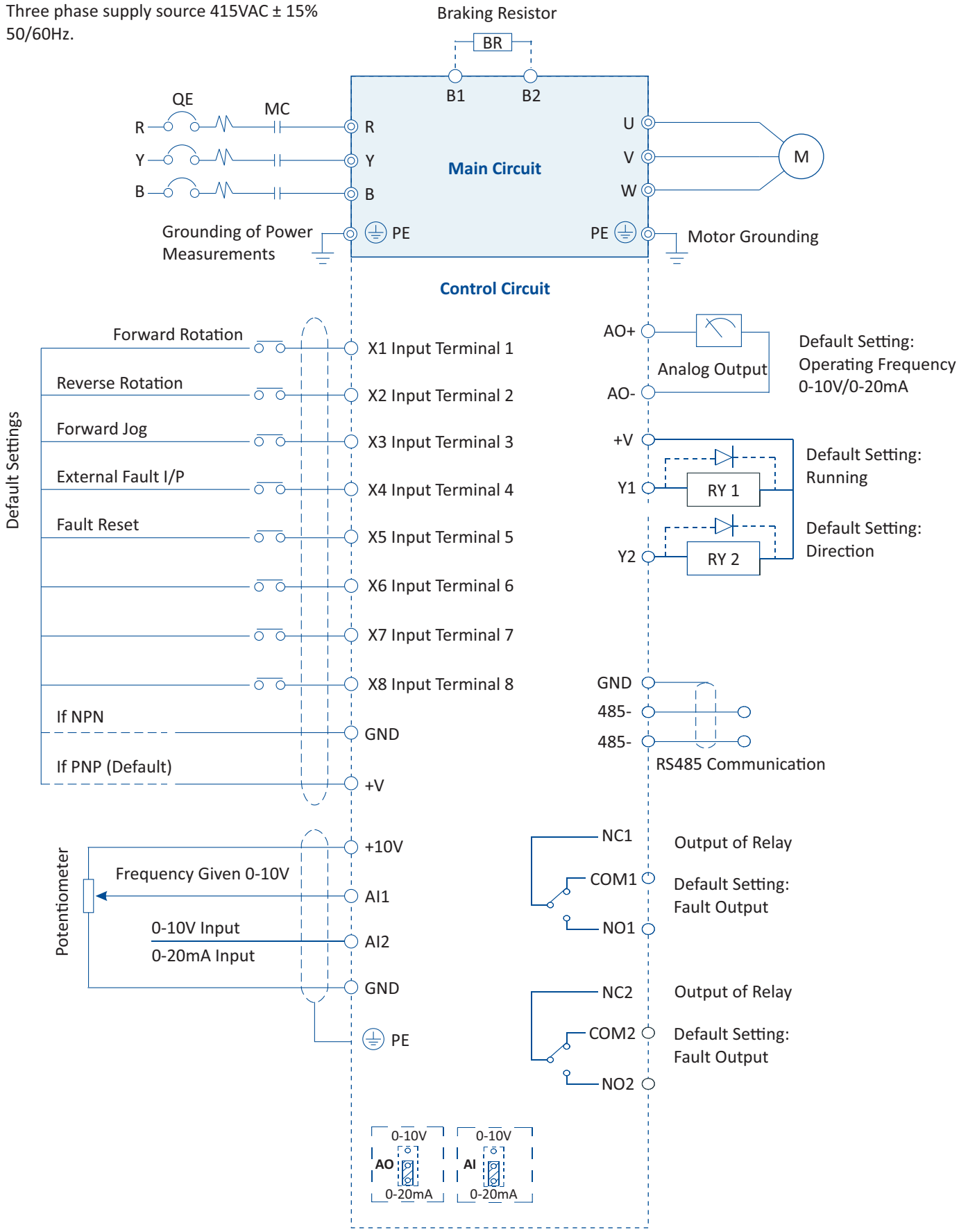


Model	Mounting Dimension			Dimension				Bore Dia.	Net Weight
	A (mm)	B (mm)	C (mm)	H (mm)	W (mm)	D (mm)	E (mm)	(mm)	(kg)
S Type Frame 2	235	148	134	247	160	173	40	5.5	3.2
S Type Frame 3	305	205	157	320	220	197		5.5	6.5

Control Terminals

Class	Sign	Terminal Name	Terminal Instructions and Factory Preset
Multi-functional Inputs (NPN and PNP selectable from parameter configuration)	X1	Multifunction input terminal 1	Default: Forward run
	X2	Multifunction input terminal 2	Default: Reserve run
	X3	Multifunction input terminal 3	Default: Forward jog
	X4	Multifunction input terminal 4	Default: External fault input
	X5	Multifunction input terminal 5	Default: Fault reset
	X6	Multifunction input terminal 6	Default: Disabled
	X7	Multifunction input terminal 7	Default: Disabled
	X8	Multifunction input terminal 8	Default: Disabled
	GND	Common terminal	Multi-functional input common terminal and ground reference for +24V power supply terminal (to be used for inputs when in NPN mode)
Analog Input	AI1	Analog input 1	0-10V / POT
	AI2	Analog input 2	0~10V input or 0~20mA (switch for selection) (0/4~20mA through parameter selection)
	GND	Analog input ground	Analog input ground
Multi-functional Output	+V	+24V power supply	+24VDC / 50mA (it can be used for inputs when in PNP mode)
	Y1	Multifunction open collector O/P 1	24V / 50 mA (sinking type) Default: Running status
	Y2	Multifunction open collector O/P 2	24V / 50 mA (sinking type) Default: Direction
	NO 1	Relay output 1	250V / 5A Contact Default: Fault output
	COM 1		
	NC 1		
	NO 2	Relay output 2	250V / 5A Contact Default: Disable
	COM 2		
	NC 2		
Analog Output	AO+	Analog output + terminal	0~10V output or 0~20mA output (switch for selection) (0/4~20mA through software selection)
	AO-	Analog output - terminal	

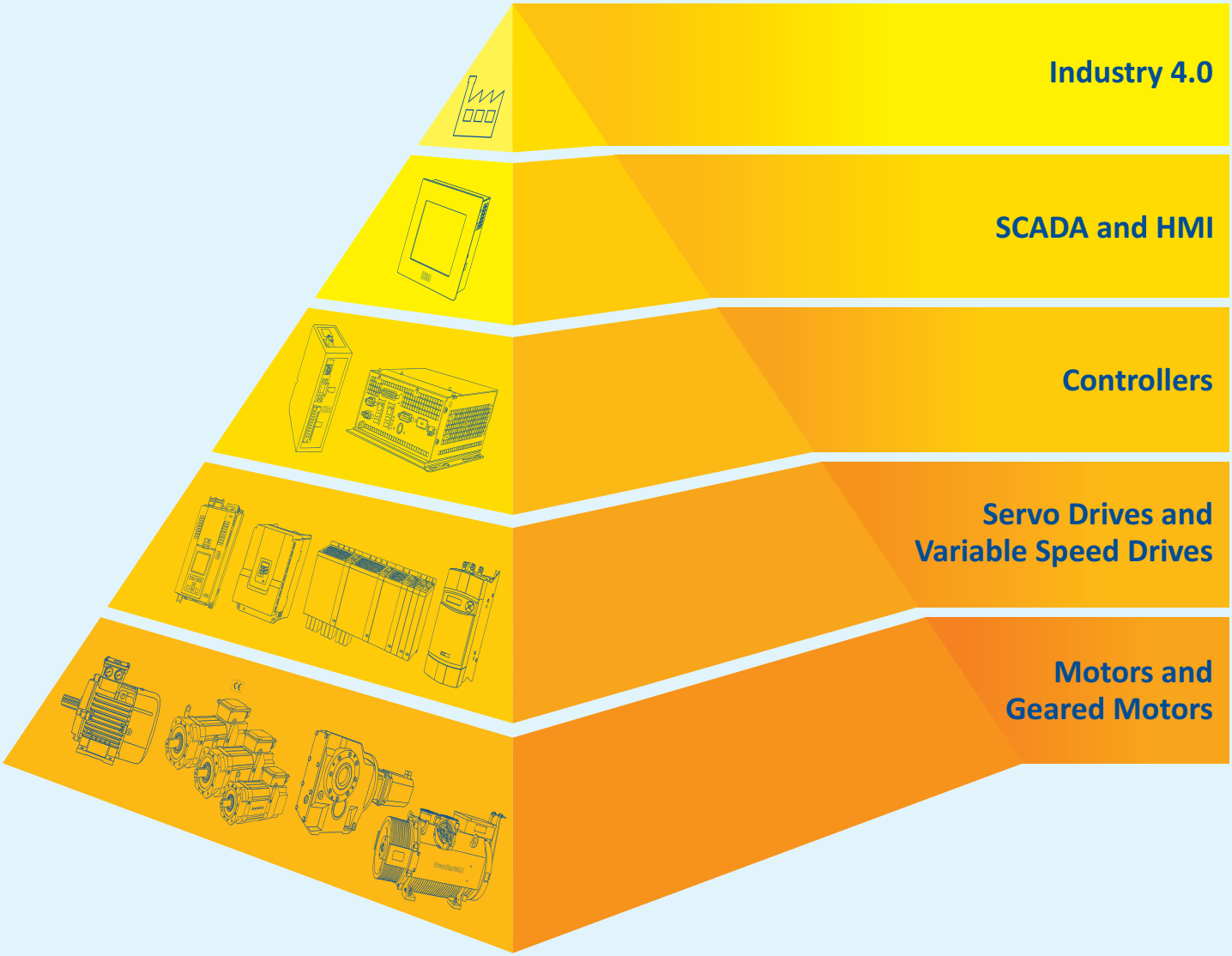
CONNECTION DIAGRAM OF BL50N VFD: 3.75kW TO 15kW



Note: PNP and NPN settings can be changed in P5-12.

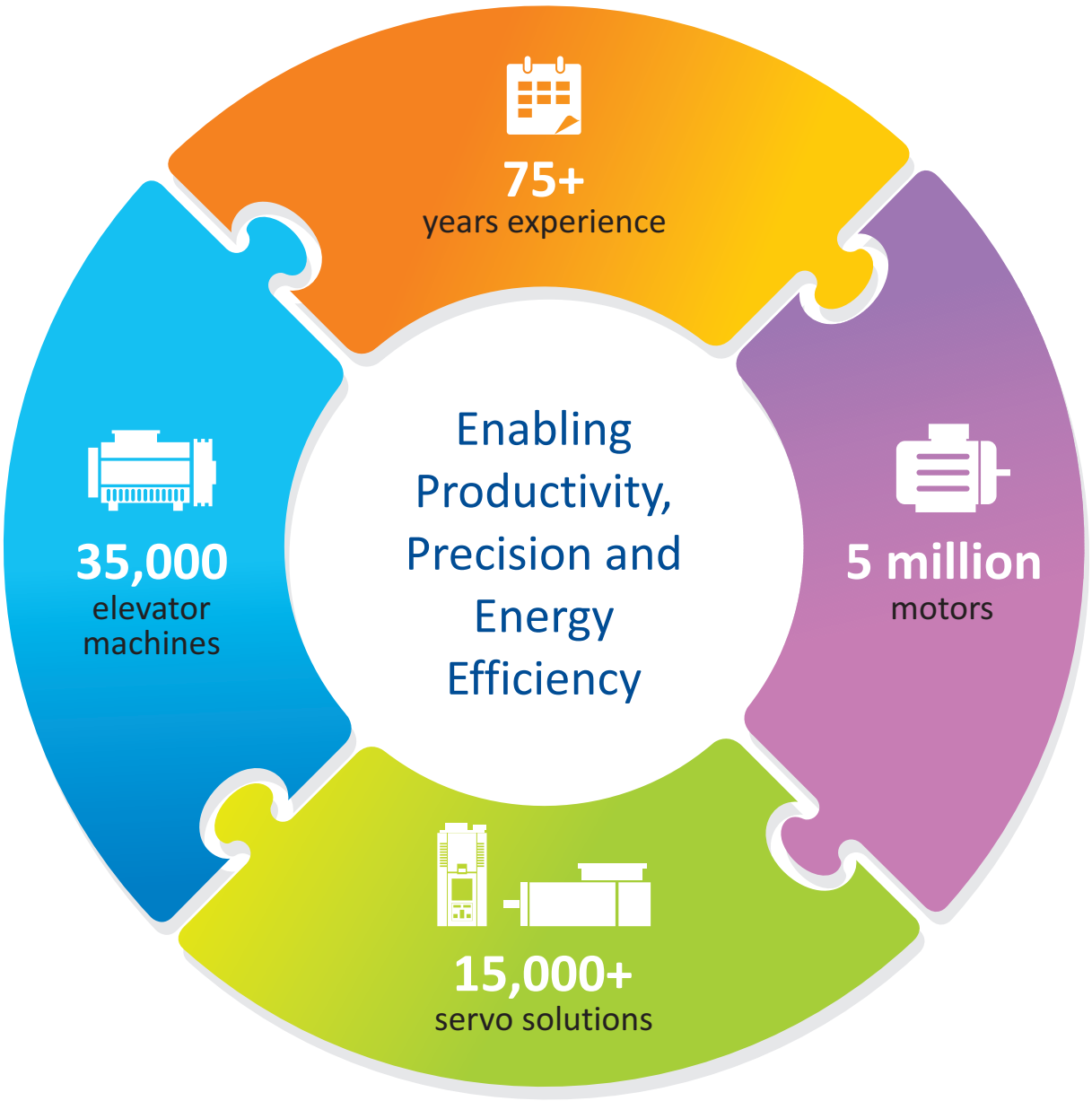
INDUSTRIAL AUTOMATION PYRAMID

ENABLING PRODUCTIVITY, PRECISION & ENERGY EFFICIENCY



Bharat Bijlee's Industrial Systems product portfolio caters to a spectrum of applications and spans the machine automation pyramid.

INDUSTRIAL SYSTEM SOLUTIONS



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- Regional Offices
- Works
- Service Centre: Drives
- Service Centre: Servo Motors

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