

Bardac Drives Catalog 2023

Issue 1



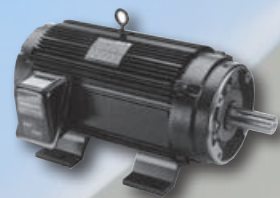
drive.web AUTOMATION



AC DRIVES



DC DRIVES



MOTORS



SERVICE

AutomationThings

Everything is...

- ... Internet accessible**
- ... Ethernet workable, peer-to-peer**
- ... Configurable from anywhere**
- ... IIoT ready**

AutomationThings.com

Everything normally in stock!

Since our founding in 1992 we have worked hard to build our reputation around key goals:

- Innovative technologies.
- Reliable products.
- Unrelenting customer support.
- All catalog items normally in stock.
- Competitive pricing.



Our Company President: Paul Crowhurst

Bardac ...the safe bet!

Seamlessly Integrated Automation



AC DRIVES

Vector Systems
To 350 HP - pages 36 - 38

ECO fan & pump
To 350 HP - pages 39 - 41

General Purpose
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To 15 HP - page 44

Single Phase
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CONTROLLERS

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smarty
Universal Automation Controllers
with I/O - pages 14 - 19

speedy
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smart motion controllers
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For industrial PC touch screens
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DC DRIVES

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POWER QUALITY ~ MOTORS ~ ENGINEERING ~ SERVICE ~ SUPPORT ~ TRAINING

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Specifications ... At the time of going to press we believe the information in this catalog to be accurate. However, the specifications of products may be amended at any time, so please check with us when ordering to ensure that such changes will not affect your requirements.

AC drives



P2 Series Closed Loop Vector

High performance coordinated drive for:
Process automation
Converting
Printing
Machine tools

Up to 100 HP at 230 volts
Up to 400 HP at 460 volts
Up to 150 HP at 600 volts

IP20 package up to 400 HP - 50°C *
Optional NEMA 4X (IP66) to 40HP - 40°C *
NEMA 12 (IP55) 15 to 400 HP - 40°C *
*** Approvals: UL, cUL, EAC, RCM**

Closed loop speed better than 0.1%
150% overload, 60 secs (200%, 4 secs)
Up to 200% torque at zero speed
AC Induction, PM & Sync Rel motor modes
Built in brake transistor
EMC filter
Quiet - with switching up to 32KHz
Bright TFT display
DC Bus sharing
Safe Torque Off function
(IEC61508 SIL 2 & IEC62062 SIL 2)
Modbus or CANopen port
Plug-in control terminals

Options

drive.web programmable control
Extended I/O and USB
EIP, ModbusTCP, ProfibusDP, DeviceNet
Remote keypad with TFT display
savvyPanel touch screen HMI



V3 Series - Energy Efficient Drives For Fans & Pumps

Variable torque, fan & pump drive for:
HVAC
Water treatment
Building systems
Climate control
Flow control
Swimming pool control

Up to 100 HP at 230 volts
Up to 400 HP at 460 volts
Up to 175 HP at 600 volts

IP20 package up to 400 HP - 50°C *
NEMA 4X (IP66) to 40HP - 40°C (indoor) *
NEMA 12 (IP55) 15 to 400HP - 40°C *
*** Approvals: UL, cUL, EAC, RCM**

Motor options: Standard Induction - PM AC - Brushless DC - Synchronous Reluctance

Pump Features

Pump blockage detect/clear/stir
Pump preheat anti-condensation mode
Pump cascade control
Dry run protection

Options

drive.web programmable control
Extended I/O and USB
EIP, ModbusTCP, ProfibusDP, DeviceNet
Remote keypad with TFT display
Power disconnect
savvyPanel touch screen HMI

Low input harmonic current distortion
Compliant with EN61000-3-12
>98% drive efficiency
Low audible motor noise
Internal EMC filter
Smart energy optimization
Resonance avoidance
Sleep/wake functions
Intelligent maintenance intervals
110% overload, 60 secs
Motor flux braking
Quiet - with switching up to 32KHz
Power loss ride through
ModbusRTU, BACnet
Bright TFT display

Fan Features

Drive fault auto bypass
Sleep mode with auto-boost
Fire override mode

drive.web distributed Ethernet control
Internet accessibility
Ethernet peer-to-peer networking
USB programming port
IIoT ready

TOUGH DRIVES FOR INDUSTRY



E3 Series General Purpose VFD

Constant torque, heavy duty drive for:
General purpose machine control
Pumps and blowers
Conveyors
Mixers

To 1.5 HP at 110V in, 230V 3Ø out
To 25 HP at 230 volts
To 50 HP at 460 volts

Sensorless vector control for:
High starting torque & accurate speed
Motors: Induction, PM, BLDC, SynRM

Standard IP20 - 50°C
Optional NEMA 4X (IP66) to 30 HP, 40°C
Approvals: UL, CE, RCM

Industrial, Pump & Fan control modes
150% overload, 60 secs (175%, 2 secs)
Spinstart into rotating motor
Built in brake transistor (sizes 2, 3 & 4)
Motor flux braking
Adjustable skip frequency
Quiet - with switching up to 32KHz
Power loss ride through
ModbusRTU port
Configurable I/O
Simple programming
On board help card
DIN rail and foot mount (IP20) (size 1 & 2)
NEMA 4X

Options

drive.web programmable control
Extended I/O
EIP, ModbusTCP, ProfibusDP, DeviceNet
Remote keypad with TFT display
savvyPanel touch screen HMI



NEMA 4X - IP66 Series For Harsh Environments

P2 Series Open/Closed Loop Vector Drives
E3 Series General Purpose VFDs
V3 Series Energy Efficient Drives
Food processing
Agricultural, water treatment
Mining, cement, petrochemical

To 1.5 HP at 110V in, 230V 3Ø out (E3)
To 15 HP at 230 volts (E3, P2)
To 30 HP at 460 volts (E3, P2)

NEMA 4X (IP66) - 40°C
(outdoor rated)
Approvals: V3 - UL, cUL, EAC, RCM
P2 - UL, cUL, EAC, RCM
E3 - UL, CE, RCM

Open & closed loop vector or V/Hz
Washdown, dust tight
Chemical resistant ABS enclosure
Corrosion protected heat sink
Spinstart into rotating motor
Built in brake transistor (sizes 2 & 3)
Motor flux braking
Bright TFT Display
Adjustable skip frequency
Quiet - with switching up to 32KHz
Power loss ride through
ModbusRTU port
Compact packaging

Options

drive.web programmable control
Power isolator switch, speed pot, F/R switch
EIP, ModbusTCP, ProfibusDP, DeviceNet
Remote keypad with TFT display
savvyPanel touch screen HMI



E3 Single Phase VFD For SP & PSC motors

Variable torque, fan & pump drive for:
Fans & blowers
Centrifugal pumps
Fume extractors
Air flow control

To 0.75 HP at 110 volts
To 1.5 HP at 230 volts

Standard IP20 - 50°C
Optional NEMA 4X (IP66) - 40°C
(outdoor rated)

Approvals: UL, CE, RCM

For motor types:
Shaded Pole (SP)
Permanent Split Capacitor (PSC)
Built in brake transistor (size 2)
Motor flux braking
Adjustable skip frequency
Quiet - with switching up to 32KHz
Bright TFT display
Power loss ride through
ModbusRTU port
Innovative smart boost start
Simple programming
DIN rail and foot mount (IP20)

Options

drive.web programmable control
Extended I/O
EIP, ModbusTCP, ProfibusDP, DeviceNet
Remote keypad with TFT display
savvyPanel touch screen HMI

V3 ECO DRIVES

Energy Efficient Drives

Variable torque, fan & pump drive for:

HVAC

Building systems

Climate control

Flow control

Up to 400HP at 460 Volts

IP20 up to 400HP - 50°C

NEMA12 (IP55) 10 to 400HP - 40°C *

NEMA4X (IP66) to 40HP - 40°C (indoor) *

- Low input harmonic current distortion
- Compliant with EN61000-3-12
- >98% drive efficiency
- Low audible motor noise
- Clear, TFT, multi-language display
- Internal EMC filter
- Smart energy optimization
- Smart pump & fan functions
- Resonance avoidance
- Sleep/wake functions
- Intelligent maintenance intervals
- 110% overload, 60 secs
- Motor flux braking
- ModbusRTU, BACnet
- Energy optimization for max efficiency
- DC bus chokes in frames 5 - 8

Options

drive.web savvy smart programmable automation

Easy off site Internet access to complete systems

Ethernet peer-to-peer networking

Extended I/O

EIP, ModbusTCP, ProfibusDP, DeviceNet

Remote keypad with bright TFT display

Power disconnect, sizes 2 & 3

savvyPanel touch screen HMI



Motor compatibility:

- Induction motors
- PM AC motors
- Brushless DC motors
- Synchronous reluctance

V3 ECO DRIVE

With Smart Energy Optimization

Typically saves 2 to 4% energy over standard VFDs

Every 1% saves 1100 kWh per year for 50HP running 60 hours a week, 50 weeks a year!





VARIABLE TORQUE FAN & PUMP DRIVES

UP TO 400 HP

- Fan & pump features
- IP20 units to 400 HP
- NEMA 4X (IP66) units to 40 HP
- NEMA 12 (IP55) units to 400 HP
- BACnet & ModbusRTU

FEATURES

Dedicated HVAC and centrifugal pump controller
 Built in EMC filter standard
 DC bus chokes built in, sizes 6 - 7
 Multi-language, plain text TFT display for ease of use
 Energy optimization for maximum efficiency
 BACnet and ModbusRTU as standard
 Built-in hours run and kWh meters
 Built-in PID controller
 Advanced application functions for easy programming
 High frequency switching (up to 32kHz) for quiet running
 Built-in motor flux braking
 Programmable I/O
 Power loss ride through
 40°C ambient
 HVAC functions:

- Bi-directional Fire Mode for emergency ventilation
- Drive fault bypass select
- Sleep mode with auto boost

Pump functions:

- Blockage detection/clear/stir
- Adjustable cleaning cycle
- Multi-pump cascade control
- Dry run protection
- Pump pre-heat anti condensation mode

Standards - UL, cUL, EAC, and RCM

Options:

drive.web savvy smart programmable automation
savvyPanel graphical, touch screen operator technology
 Easy, off site Internet access to the complete system
 Ethernet peer to peer networking
 Remote keypad with bright TFT display
 Ethernet ModbusTCP and EIP
 3 additional relay outputs for cascade control
 Additional **smarty** I/O option
 Built in power isolator switch sizes 2 & 3

V3 ECO PUMP & FAN

Specifications

Input Ratings	Supply Voltage	200 - 240 ± 10% 380 - 480 ± 10% 500 - 600 ± 10%
	Supply Frequency	48 - 62 Hz
	Displacement PF	> 0.98
	Phase Imbalance	3% Maximum allowed
	Inrush Current	< Rated current
	Power Cycles	120 per hour max, evenly spaced
Output Ratings	Power Output	230V, 1-ph in: 1-10 HP (0.75-7.5 kW) 230V, 3-ph in: 1-100 HP (0.75-75 kW) 460V, 3-ph in: 1-400 HP (0.75-250kW) 575V, 3-ph in: 1-175 HP (0.75-110kW)
	Overload Capacity	110% for 60 secs, 125% for 2 secs.
	Output Frequency	0-120Hz, 0.1 Hz resolution
Ambient Ratings	Temperature	Storage: -40°C to 60°C Operating: -10°C to 40°C
	Altitude	Up to 1000m ASL without de-rating Up to 2000m Max UL Approved Up to 4000m Max (non UL) Above 1000m, de-rate 1% per 100m
	Humidity	95% non-condensing
Enclosures	Ingress Protection	NEMA4X sizes 2 - 4; NEMA12 sizes 4 - 8
Programming	Keypad	Standard: built in keypad Optional: Remote keypad drive.web savvy software
	Display	Multi-Language TFT Display
Control	Control Modes	ECO sensorless vector for: motor options: Standard Induction, PMAC, BLDC, Sync Rel
	Modulation	4 - 32 kHz effective
	Stop Mode	Ramp to stop - adjustable 0.1-600 secs Coast to stop
	Braking	Motor flux braking (DC injection)
	Skip Frequency	Single point user adjustable
	Analog Setpoint Control	0-10V, 10-0V, ±10V 0-20mA, 20-0mA, 4-20mA, 20-4mA
	Digital Setpoint Control	Keypad ModbusRTU BACnet
	Automation	Optional drive.web Ethernet distributed control + programmable control, extra I/O, operator stations
	Communications Options	drive.web , ModbusTCP, EIP, DeviceNet, Profibus
I/O Specification	Power Supply	24VDC, 100mA short protected 10VDC, 5mA for setpoint potentiometer
	Programmable Inputs	3 x Digital 10 to 30 VDC, response <4ms 2 x Analog / digital
	Programmable outputs	2 x Analog, 0-10V, 0-20mA, 4-20mA 2 x Relay NO, 6A @ 250VAC, 5A @ 30VDC
Control & Monitoring	PID	Internal PID with feedback display
	Fault Memory	Last 4 trips stored with time stamp
	Data Logging	Current, temperature, DC Bus volts prior to trip
	Maintenance Indicator	Service life monitor with user adjustable interval
	Monitoring	Drive hours run & cooling fan run time Resettable and non-resettable kWh meters
Application functions	HVAC Functions	Fire mode for emergency ventilation
	Pump functions	Pump blockage detection Pump cleaning cycles Multi-pump cascade control Pump stir mode

The harder they work, the more you save!

200-240V ± 10%, 1-ph in, 230V, 3-ph motor

Model HP Amps Size NEMA

size 2 - IP20, TFT display & EMC Filter:

V3-220043-1F12	1	4.3	2	IP20
V3-220070-1F12	2	7	2	IP20
V3-220105-1F12	3	10.5	2	IP20

size 2 - NEMA 4X, TFT display & EMC Filter:

V3-220043-1F1A or E	1	4.3	2	4X
V3-220070-1F1A or E	2	7	2	4X
V3-220105-1F1A or E	3	10.5	2	4X

200-240V ± 10%, 3-ph in, 230V, 3-ph motor

Model HP Amps Size NEMA

sizes 2 & 3 - IP20, TFT display & EMC Filter:

V3-220043-3F12	1	4.3	2	IP20
V3-220070-3F12	2	7	2	IP20
V3-220105-3F12	3	10.5	2	IP20
V3-320180-3F12	5	18	3	IP20
V3-320240-3F12	7.5	24	3	IP20

sizes 2 & 3 - NEMA 4X, TFT display & EMC Filter:

V3-220043-3F1A or E	1	4.3	2	4X
V3-220070-3F1A or E	2	7	2	4X
V3-220105-3F1A or E	3	10.5	2	4X
V3-320180-3F1A or E	5	18	3	4X
V3-320240-3F1A or E	7.5	24	3	4X

sizes 4-7 - NEMA 12, TFT display, EMC filter:

V3-420300-3F1N ‡	10	30	4	12
V3-420460-3F1N ‡	15	46	4	12
V3-520610-3F1N ‡	20	61	5	12
V3-520720-3F1N ‡	25	72	5	12
V3-520900-3F1N ‡	30	90	5	12
V3-621100-3F1N ‡	40	110	6	12
V3-621500-3F1N ‡	50	150	6	12
V3-621800-3F1N ‡	60	180	6	12
V3-722020-3F1N	75	202	7	12
V3-722480-3F1N	100	248	7	12

380-480V ± 10%, 3-ph in, 460V, 3-ph motor

Model HP Amps Size NEMA

sizes 2 & 3 - IP20, TFT display & EMC Filter:

V3-240022-3F12	1	2.2	2	IP20
V3-240041-3F12	2	4.1	2	IP20
V3-240058-3F12	3	5.8	2	IP20
V3-240095-3F12	5	9.5	2	IP20
V3-340140-3F12	7.5	14	3	IP20
V3-340180-3F12	10	18	3	IP20
V3-340240-3F12	15	24	3	IP20

sizes 2 & 3 - NEMA 4X, TFT display & EMC Filter:

V3-240022-3F1A or E	1	2.2	2	4X
V3-240041-3F1A or E	2	4.1	2	4X
V3-240058-3F1A or E	3	5.8	2	4X
V3-240095-3F1A or E	5	9.5	2	4X
V3-340140-3F1A or E	7.5	14	3	4X
V3-340180-3F1A or E	10	18	3	4X
V3-340240-3F1A or E	15	24	3	4X

sizes 4-7 - NEMA 12, TFT display & EMC filter:

V3-440300-3F1N ‡	20	30	4	12
V3-440390-3F1N ‡	25	39	4	12
V3-440460-3F1N ‡	30	46	4	12
V3-540610-3F1N ‡	40	61	5	12
V3-540720-3F1N ‡	50	72	5	12
V3-540900-3F1N ‡	60	90	5	12
V3-641100-3F1N ‡	75	110	6	12
V3-641500-3F1N ‡	120	150	6	12
V3-641800-3F1N ‡	150	180	6	12
V3-642020-3F1N ‡	175	202	6	12
V3-742400-3F1N	200	240	7	12
V3-743020-3F1N	250	302	7	12
V3-843700-3F1N ‡	300	370	8	12
V3-844800-3F1N ‡	400	480	8	12



speedy on board

Ethernet networking
USB programming
smart automation

**Size 2 & 3 drives
model number
suffix A or E**

A = no disconnect
switch

E = with power
disconnect switch

**ECO
Efficient
Economical
Smart
Solutions**



Note:

Drives marked ‡ are
also available in IP20
form. Please call for
details, pricing, and
availability.

Dimensions & Weights

Size	2	3	4	5	6	7	8
IP20 Drives							
Height (ins)	8.7"	10.3"	19.1"				38.3"
Height (mm)	221	261	418				974
Width (ins)	4.4"	5.2"	6.7"				17.4"
Width (mm)	110	131	233				444
Depth (ins)	7.3"	8.1"	10.2"				16.6"
Depth (mm)	185	205	260				423
Weight LB/KG	4/1.8	7.7/3.5	40/18.1				274/125

NEMA 4X (IP66) Drives

Height (ins)	10.1"	12.2"	14.2"				
Height (mm)	257	310	360				
Width (ins)	7.4"	8.3"	9.5"				
Width (mm)	188	211	240				
Depth (ins)	9.4"	10.5"	10.7"				
Depth (mm)	239	266	271				
Weight LB/KG	10.6/4.8	17.7/7.7	20.9/9.5				

NEMA 12 (IP55) Drives

Height (ins)	17.8"	21.3"	34.1"	50.4"	52.5"		
Height (mm)	450	540	865	1280	1334		
Width (ins)	6.8"	9.3"	13.0"	13.0"	17.5		
Width (mm)	173	235	330	330	444		
Depth (ins)	9.9"	10.6"	13.0"	14.2"	16.6		
Depth (mm)	252	270	330	360	423		
Weight LB/KG	25/12	51/23	121/55	196/89			

600 Volts Drives

500-600V ± 10%, 3-ph in

500-600V, 3-ph motor

Model HP Amps Size NEMA

IP20 with TFT display

V3-260021-3012	1	2.1	2	IP20
V3-260031-3012	2	3.1	2	IP20
V3-260041-3012	3	4.1	2	IP20
V3-260065-3012	5	6.5	2	IP20
V3-260090-3012	7.5	9	2	IP20
V3-360120-3012	10	12	3	IP20
V3-360170-3012	15	17	3	IP20
V3-360220-3012	20	22	3	IP20

NEMA 4X (IP66), with TFT text display

Unswitched

V3-260021-301A	1	2.1	2	4X
V3-260031-301A	2	3.1	2	4X
V3-260041-301A	3	4.1	2	4X
V3-260065-301A	5	6.5	2	4X
V3-260090-301A	7.5	9	2	4X
V3-360120-301A	10	12	3	4X
V3-360170-301A	15	17	3	4X

w/Disconnect

V3-260021-301E	1	2.1	2	4X
V3-260031-301E	2	3.1	2	4X
V3-260041-301E	3	4.1	2	4X
V3-260065-301E	5	6.5	2	4X
V3-260090-301E	7.5	9	2	4X
V3-360120-301E	10	12	3	4X
V3-360170-301E	15	17	3	4X

NEMA 12 (IP55) with TFT text display

V3-460220-301N ‡	20	22	4	12
V3-460280-301N ‡	25	28	4	12
V3-460340-301N ‡	30	34	4	12
V3-460430-301N ‡	40	43	4	12
V3-560540-301N ‡	50	54	5	12
V3-560650-301N ‡	60	65	5	12
V3-660780-301N ‡	75	78	6	12
V3-661050-301N ‡	100	105	6	12
V3-661300-301N ‡	125	130	6	12
V3-661500-301N ‡	150	150	6	12

Engineering & Support



AC and DC motors from fractional to over 2000 HP

All speed ranges, duties, enclosures and voltages complete with a full range of accessories such as encoders, tachs, thermal protection, brakes, blowers, filters, brushes and slide bases. Please call for details and competitive pricing.

Modulus Packaged Drives

Modulus solutions are a range of standard, pre-engineered drive packages with a selection of options for wide range common applications.

Using the flexible **drive.web** programmable automation technology it is possible to adapt a small range of hardware configurations to a wide range of applications thereby keeping design and manufacturing costs to a minimum.

Modulus drives are available either as packages mounted on an open panel, **Modulus P**, or as assemblies installed in an enclosure, **Modulus E**, to suit the type of operating environment and the control scheme required.

Every **Modulus** project is accompanied by a detailed, 50-point, Quality Control Report covering every facet of the product, its design, construction, testing and shipping.



User manuals for all products are available from www.bardac.com

Online Product Support

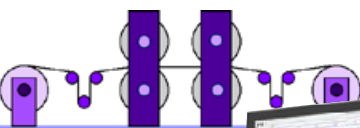
Using innovative, interactive, Internet online technologies we can provide either product training or product support through your browser from the comfort of your desk! Simply connect via your browser and get live interactive support where ever you are - with savvy running on your computer call +410-604-3400 and in less than a minute an engineer will be able to see your system live and give you the support you need.

... it's as easy as that!

Our support view

Internet

Unbeatable!



Your plant view



Online Training

Online product training courses are scheduled every week with options for users of all levels of interest and ability.

Level 1 - drive.web introductory seminar - 1½ hours - Free!

This provides an overview of the **drive.web** automation technology. Learn how to connect to drives, create drive “phantoms”, navigate systems, create signal flow diagrams and system drawings, find information, identify object attributes, make connections, show trend charts, build **savvyPanel** operator stations, etc.

Level 2 - drive.web design technology course - 3 hours (Level 1 is a prerequisite)

Covers configuration of drives, basic system design concepts, Ethernet networking, password protection, system safety

Level 3 - drive.web system design and application courses (Level 2 is a prerequisite)

3a) Drive and device interfaces - 2 hours

Covers the use of “Templates” and “Helpers” for documented drives, generic ModbusRTU master interfaces to third party drives, operator stations, etc.

3b) Winder Control Systems - 3 hours

Covers standard solutions for open loop CTCW winders, closed loop dancer controlled winders and closed loop load cell controlled winders.

3c) Encoder Control Systems - 3 hours

Covers applications such as “electronic line shaft”, spindle orientation, registration and position control.

3d) Advanced Ethernet, Internet Access and Security - 3 hours

Covers local and wide area network configuration, IP addressing, user access and device and system password protection.

For course details, registration, international training options and charges please call us at 1-888-667-7333 (toll free USA 888-ON SPEED) or international at +410-604-3400. Alternatively please contact training@driveweb.com

Terms of Sale & Payment

Complete Terms & Conditions of Sale are shown at www.bardac.com. Net 30 day credit terms are available subject to prior approval. Credit card payments are only accepted for payments made at the time of service or shipment of products and will be subject to a 4% surcharge.

Field Service, Service Center Repair, Training and Start-up - Call +410-604-3400 Rates for the Continental United States

Charge Basis

Rates (US\$)

a. Basic Rate - Field Service, Training & Start-up Assistance - up to 8 hours daily Monday to Friday, 7am to 6pm	\$190 per hour
b. Standard Overtime - Weekdays 6pm to 7am & all day Saturday - Total work time not to exceed 12 hrs in any 24 hrs	\$285 per hour
c. Special Overtime - Sundays, Holidays and excess of 8 hours on Saturday	\$380 per hour
d. Overnight - Includes meals, and hotel accommodation	\$280 per night
e. Auto Travel - Covering cost of use of company or personal cars, distance to and from the local office	\$0.655 per mile
f. Public Transport - Rental cars, Air fares, etc.	At Cost
g. Holdover & Standby Time	Same as service
h. Travel Time - Time taken from Bardac to job site and return	Same as service
i. Basic Rate - Service Center Repair charges - Diagnosis & repair time	\$130 per hour + parts
j. Design or application engineering services	\$220 per hour

Notes:

1. Minimum service billing is 4 hours for field services, 1 hour for service center services.
2. Parts, materials, special visas, duties, and extraordinary expenses will be charged extra.
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