

DIGIFLEX® DIGITAL SERVO DRIVES MODEL: DR100RE60A40NAC (-10, -16)

FEATURES:

- Fully digital, state-of-the-art design
- Space Vector Modulation and vector control technology
- 20kHz Digital current loop with programmable gain settings
- PIDF velocity loop with 100microsecond update rate
- PID + FF position loop with 100 microsecond update rate
- Resolver based commutation
- Surface-mount technology
- Small size, low cost, ease of use

- RS232/485 interface for setup and networking
- Windows© based setup software with built-in 8-channel digital scope
- Operates in torque, velocity or position mode with programmable gain settings
- Programmable profiling in all modes
- Fully configurable current, voltage, velocity and position limits.
- Step & direction mode for stepper replacement
- Encoder following with programmable gear ratio

- 4 programmable digital inputs
- 2 programmable differential inputs, configurable as step & direction, master encoder, or secondary encoder for dual loop operation
- 4 programmable digital outputs
- 2 programmable analog inputs (10-bit)
- 14-bit reference input or programmable analog input
- 2 programmable analog outputs (10-bit)
-
- Software selectable emulated encoder output resolution*

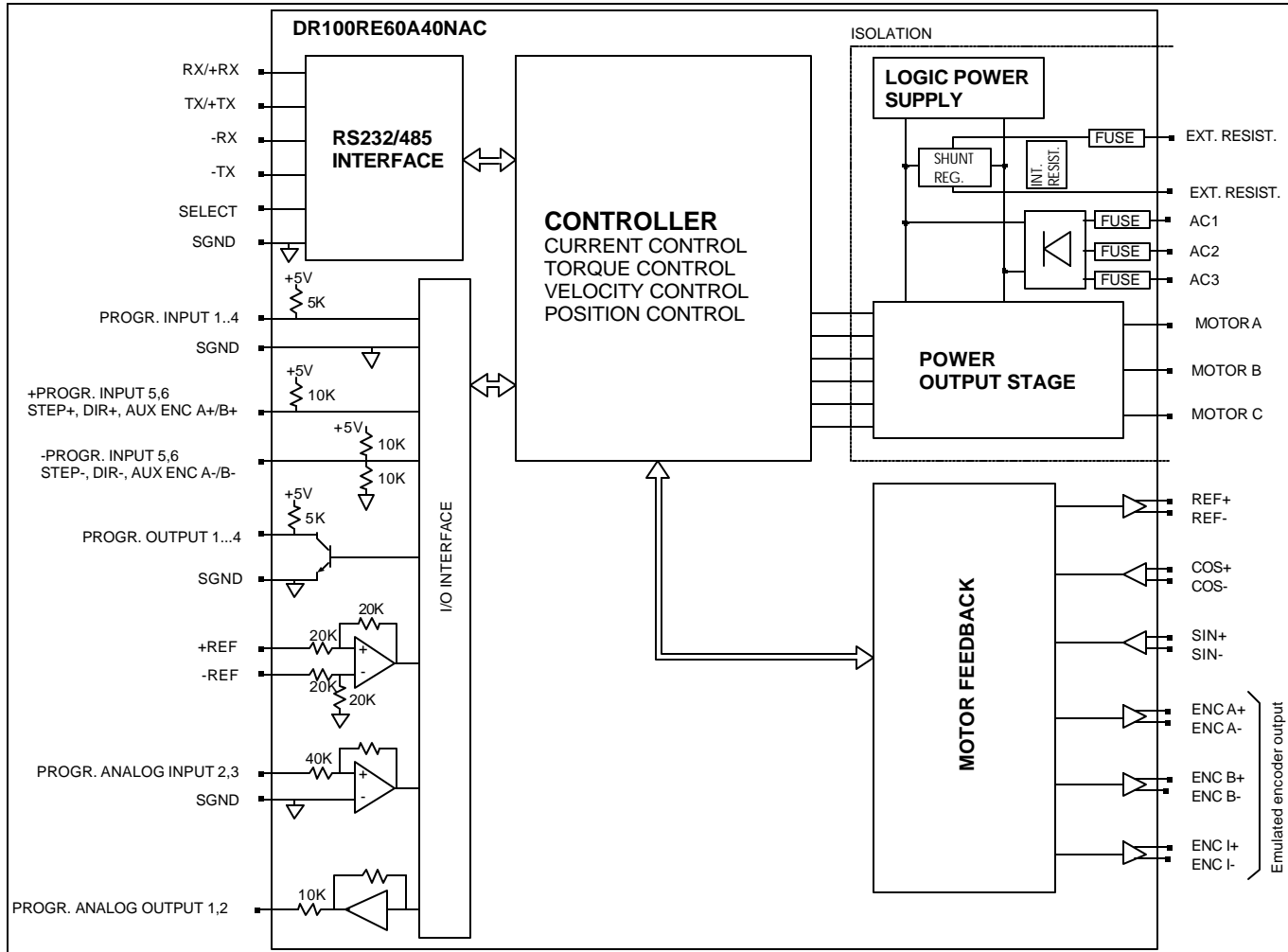
| Model Number | Low | High |
|---------------------|--------|--------|
| DR100RE60A40NAC | 12-bit | 14-bit |
| DR100RE60A40NAC -10 | 10-bit | 12-bit |
| DR100RE60A40NAC -16 | 14-bit | 16-bit |

* See maximum speed table below

- 1 or 3-phase 240VAC operation
- Four quadrant regenerative operation
- Integrated shunt regulator and resistor
- Provision for external shunt resistor
- Bi-color LED status indicator
- Extensive built-in protection against:
 - over-voltage (programmable)
 - under-voltage (programmable)
 - short-circuit: phase-phase, phase-ground
 - over-current
 - over-temperature



BLOCK DIAGRAM:



DESCRIPTION:

The DR100RE Series digital PWM servo drives are designed to drive brushed and brushless servomotors. These fully digital drives operate in torque, velocity, or position mode and employ Space Vector Modulation (SVM), which results in higher bus voltage utilization and reduced heat dissipation. The command source can be generated internally or can be supplied externally. In addition to motor control, these drives feature dedicated and programmable digital and analog inputs and outputs to enhance interfacing with external controllers and devices.

DR100RE Series drives feature a single RS232/485 interface, which is used for drive configuration and setup as well as online operation in networked applications. Drive commissioning can be accomplished through a fully graphical Windows© based application.

All drive and motor parameters are stored in non-volatile memory.

Maximum Motor Velocity

| Emulated Encoder Resolution | Maximum Motor Speed* |
|-----------------------------|----------------------|
| 10-bit | 64000 rpm |
| 12-bit | 16000 rpm |
| 14-bit | 4000 rpm |
| 16-bit | 1000 rpm |

* Assuming no other limitations limit the motor speed

SPECIFICATIONS:

| POWER STAGE SPECIFICATIONS | DR100RE60A40NAC (-10, -16) |
|---|---------------------------------------|
| AC SUPPLY VOLTAGE | 40 – 270 VAC, 1or 3-phase, 50 – 60 Hz |
| PEAK CURRENT | 60A (42.4 Arms) |
| MAXIMUM CONTINUOUS CURRENT | 30A (21.2 Arms) |
| MINIMUM LOAD INDUCTANCE | 600 µH |
| SWITCHING FREQUENCY | 20 kHz |
| HEATSINK (BASEPLATE) TEMPERATURE RANGE | 0 to 65 °C, disables at 65 °C |
| POWER DISSIPATION AT CONTINUOUS CURRENT | 400W |
| MIN. UNDER-VOLTAGE SHUTDOWN | 55 VDC |
| MAX. OVER-VOLTAGE SHUTDOWN | 439 VDC |
| BUS CAPACITANCE | 1650 µF |
| SHUNT RESISTOR | 20Ω, 100W internal |
| SHUNT SWITCH-ON VOLTAGE | Programmable |
| SHUNT FUSE | 5A Motor Delay @ 250VAC |
| AC LINE FUSING | 3 x 20A @ 600VAC |

| MECHANICAL SPECIFICATIONS | |
|--|---|
| AC SUPPLY CONNECTOR: C1 | Screw terminal |
| SHUNT AND DC OUT CONNECTOR: C2 | Screw terminal |
| MOTOR POWER CONNECTOR: P1 | Screw terminal |
| MOTOR FEEDBACK CONNECTOR: CN3* | 15-pin high density female D-sub |
| I/O CONNECTOR: CN2* | 26-pin high density female D-sub |
| COMMUNICATIONS INTERFACE (RS232/485): CN1* | 9-pin female D-sub |
| SIZE | 9.24 x 6.37 x 5.96 inches 234.7 x 161.8 x 151.3 mm |
| WEIGHT | 9.14 lbs. 4.11 kg |

* Mating connectors are not included.

PIN FUNCTIONS:

C1 – AC Supply Connector:

| CONNECTOR | PIN | NAME | DESCRIPTION | I/O |
|-----------|-----|----------|---|-----|
| C1 | 1 | AC1 | AC supply input. 40 – 270 VAC, 3-phase. | I |
| | 2 | AC2 | | I |
| | 3 | AC3 | | I |
| | 4 | CASE GND | Case ground | GND |
| | 5 | NC | Not connected | - |

C2 – Shunt and DC Out Connector:

| CONNECTOR | PIN | NAME | DESCRIPTION | I/O |
|-----------|-----|------------------|------------------------------------|------|
| C2 | 1 | HV | DC bus output | O |
| | 2 | PGND | DC bus ground | PGND |
| | 3 | EXT. SHT | External shunt resistor | O |
| | 4 | EXT SHT. | External shunt resistor | O |
| | 5 | INT. SHT. Jumper | Jumper for internal shunt resistor | - |

P1 - Motor Power Connector:

| CONNECTOR | PIN | NAME | DESCRIPTION | I/O |
|-----------|-----|------|---------------|------|
| P1 | 1 | MA | Motor phase A | O |
| | 2 | MB | Motor phase B | O |
| | 3 | MC | Motor phase C | O |
| | 4 | PGND | DC bus ground | PGND |
| | 5 | HV | DC bus output | O |

CN3 - Motor Feedback Connector:

| CONNECTOR | PIN | NAME | DESCRIPTION | I/O |
|-----------|-----|------|---|-----|
| CN3 | 1 | N/C | Not connected | |
| | 2 | N/C | Not connected | |
| | 3 | N/C | Not connected | |
| | 4 | REF+ | Resolver reference (excitation) output. 4Vrms @ 5kHz. | O |
| | 5 | REF- | | O |
| | 6 | SIN+ | Resolver sine input. 2Vrms | I |
| | 7 | SIN- | | I |
| | 8 | COS+ | Resolver cosine input. 2Vrms | I |

| | | | |
|----|---------|---|------|
| 9 | COS- | | I |
| 10 | N/C* | Not connected | |
| 11 | N/C* | Not connected | |
| 12 | SGND | Signal ground | SGND |
| 13 | +5V OUT | +5V @ 250mA max. Short-circuit protected. | O |
| 14 | PAI3 | Programmable analog input, single ended, 10-bit | I |
| 15 | N/C* | Not connected | |

* Contact factory for SR compatible options.

CN2 – I/O Connector:

| CONNECTOR | PIN | NAME | DESCRIPTION | I/O |
|-----------|-----|---------|--|------|
| CN2 | 1 | PDO1* | Programmable digital output | O |
| | 2 | SGND | Signal ground | SGND |
| | 3 | PDO2* | Programmable digital output | O |
| | 4 | +REF | Differential reference signal input, 14-bit resolution. Can also be used as programmable analog input 1. | I |
| | 5 | -REF | | I |
| | 6 | PAI2 | Programmable analog input | I |
| | 7 | PAO1 | Programmable analog output | O |
| | 8 | PAO2 | Programmable analog output | O |
| | 9 | -PDI6 | Programmable Input (see CN2-18) or Direction- or Aux Enc B- | I |
| | 10 | PDO3 | Programmable digital output | O |
| | 11 | PDI1 | Programmable digital input | I |
| | 12 | PDI2 | Programmable digital input | I |
| | 13 | PDI3 | Programmable digital input | I |
| | 14 | PDO4 | Programmable digital output | O |
| | 15 | +5V OUT | +5VDC. Note: the total current on CN2-15 and CN3-13 combined should not exceed 250 mA | O |
| | 16 | SGND | Signal ground | SGND |
| | 17 | +PDI5 | Programmable differential digital input, or Step+ or Aux Enc A+ | I |
| | 18 | +PDI6 | Programmable, differential digital input or Direction+ or Aux Enc B+ | I |
| | 19 | PDI4 | Programmable digital input | I |
| | 20 | Enc A+ | Emulated channel A output. (10, 12, 14, or 16 bit resolution) | O |
| | 21 | Enc A- | | O |
| | 22 | Enc B+ | Emulated channel B output. (10, 12, 14, or 16 bit resolution) | O |
| | 23 | Enc B- | | O |
| | 24 | Enc I+ | Emulated index output. High when | O |

| | | | | |
|--|----|--------|--|---|
| | 25 | Enc I- | channel A and B or both low. | O |
| | 26 | -PDI5 | Programmable Input (See CN2-17) or Step- or Aux Enc A- | I |

* Contact factory for SR compatible options.

CN1 - Communications Interface (RS232/485):

| CONNECTOR | PIN | NAME | DESCRIPTION | I/O |
|-----------|-----|--------|--|------|
| CN1 | 1 | SELECT | RS232/485 selection. Pull to ground (CN1-5) for RS485. | I |
| | 2 | TX/+TX | RS232: Transmit; RS485: +TX | O |
| | 3 | RX/+RX | RS232: Receive; RS485: +RX | I |
| | 4 | N/C | Not connected | |
| | 5 | SGND | Signal ground | SGND |
| | 6 | -TX | RS485: -TX | O |
| | 7 | N/C | Not connected | |
| | 8 | -RX | RS485: -RX | I |
| | 9 | N/C | Not connected | |

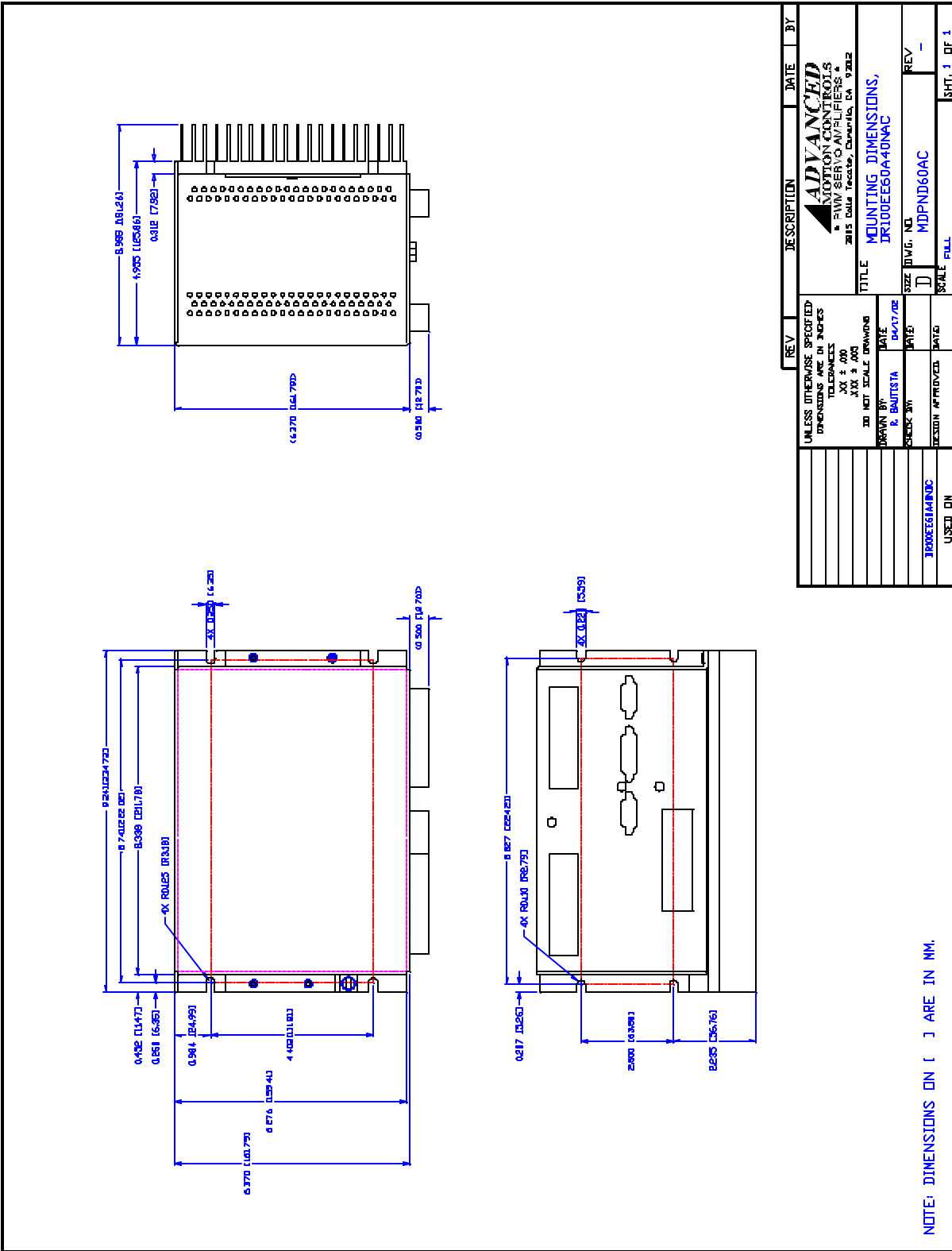
ORDERING INFORMATION:

Standard model: DR100RE60A40NACX

Options: DR100RE60A40NACX-10, DR100RE60A40NACX-16

X indicates the current revision letter.

MOUNTING DIMENSIONS:



NOTE: DIMENSIONS ON [] ARE IN MM.

| REV | DESCRIPTION | DATE | BY |
|-----|---|------------------|-------------|
| | UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES XX ± .000 XX ± .005 XX NOT SCALE DIMENSIONS | | |
| | DRAWN BY R. BAUTISTA | DATE 04/27/08 | |
| | CHECK BY | DATE | |
| | DESIGN APPROVED | DATE | |
| | USED ON MDPND60AC | | |
| | TITLE MOUNTING DIMENSIONS, DR100EE60A40NAC | | |
| | SIZE DWG. NO. MDPND60AC | | |
| | SCALE FULL | | |
| | | | SHT. 1 OF 1 |