



AXPERT - OPTI torque

The High Performance Electronic Digital Softstarter

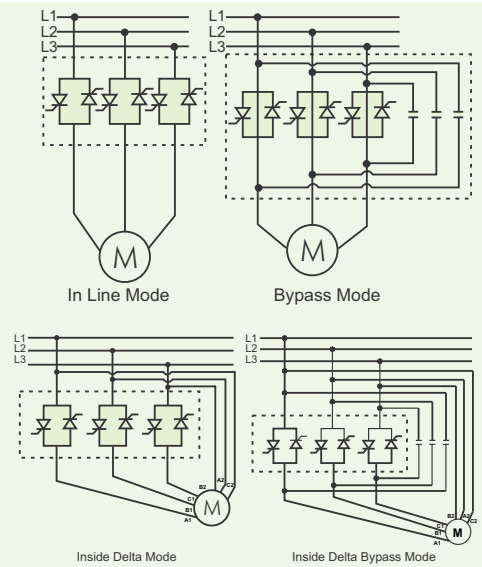
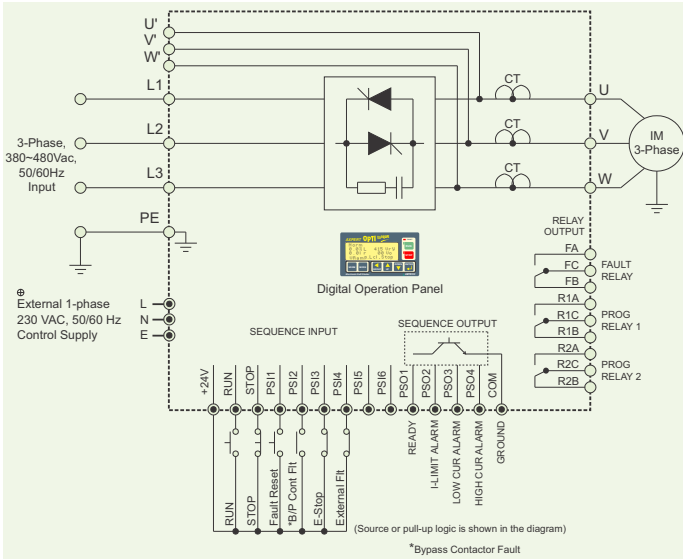
Features

30~900 kW (40~1200 HP)
(200 V, 400 V, 500 V & 600 V Series)

- Three Motor Starting Modes
1. Voltage Ramp 2. Current Ramp 3. Torque Ramp
- Four Motor Stopping Modes
1. Voltage Ramp 2. Torque Ramp 3. Brake Stop
4. Coast-to-stop
- Three Control Modes
1. Local 2. Terminal 3. Serial
- Energy Meter Standard in both kWh & MWh
- Integrated Electronic Motor Overload & Over current protection
- In-line / Bypass / Inside Delta operating modes
- Standard PID Function
- In-built PLC Function
- Kick Voltage Start / Jog Function
- RS-485 Modbus Communication
- 80-Character, 4-Line LCD Display Backlit with 8-key Keypad
- Full complement of Analog and Digital Inputs / Outputs
- Stores last 10 Diagnostic Faults with record of 4 key operational values at the time of fault
- Senses current in all three phases and provides Current, Voltage & Power information; protection even in bypass mode
- Global Design  
 - EMC Compliances IEC 60947 - 4 - 2
 - IEC 61000 - 4 - 2 IEC 61000 - 4 - 5
 - IEC 61000 - 4 - 3 IEC 61000 - 4 - 6
 - IEC 61000 - 4 - 4 EN 55011

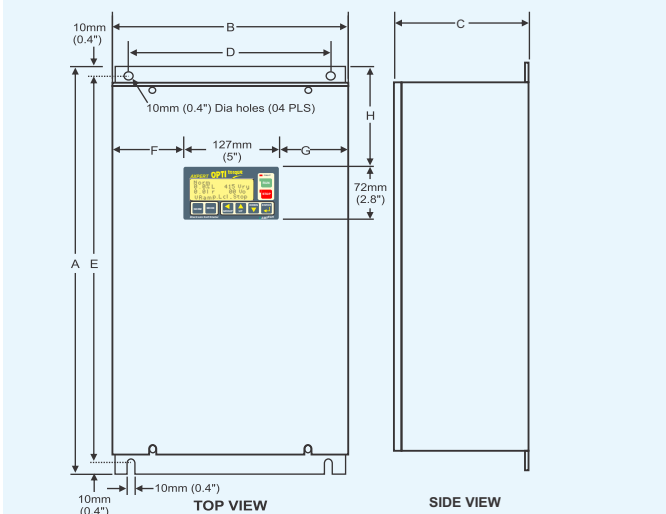


| | | | | | | | | | | | | | | | | | | | |
|--------------------------|--|--|--|-----|-----|--|-----|--------------------------|---|---|-----|-----|------|---|------|------|------|------|------|
| Power Source | | 380~480 VAC, 3-Phase, 3-Wire, 50 / 60 Hz (Also available in 200 V, 500 V & 600 V series) | | | | | | | | | | | | | | | | | |
| Tolerance | | Voltage tolerance: ±10%, Frequency tolerance: ±5% | | | | | | | | | | | | | | | | | |
| AMT-OT-XXX-4-X | | 030 | 037 | 045 | 055 | 075 | 090 | 110 | 132 | 160 | 200 | 250 | 315 | 400 | 450 | 500 | 585 | 630 | 710 |
| Inline Rating | Max Applicable motor (kW) | 30 | 37 | 45 | 55 | 75 | 90 | 110 | 132 | 160 | 200 | 250 | 315 | 400 | 450 | 500 | 585 | 630 | 710 |
| | Max applicable motor line current (A) | 60 | 72 | 87 | 110 | 147 | 175 | 215 | 245 | 320 | 360 | 470 | 590 | 720 | 800 | 880 | 950 | 1065 | 1200 |
| Inside Delta | Max Applicable motor (kW) | 45 | 55 | 75 | 90 | 132 | 132 | 200 | 200 | 250 | 315 | 450 | 585 | 710 | 800 | 875 | 940 | 1060 | 1190 |
| | Max applicable motor line current (A) | 104 | 124 | 150 | 190 | 254 | 303 | 372 | 424 | 554 | 623 | 814 | 1021 | 1247 | 1385 | 1524 | 1645 | 1844 | 2078 |
| Control | Control system Standard digital inputs +24V supply Serial port Control Supply | Digital 32-bit Digital Signal Processor Programmable Inputs 1 ~ 8 Max. +24 VDC supply current is 100 mA Supports RS-485 External 230 VAC (115 VAC for UL), 1-phase supply to be provided by the user. Capacity varies as per the rating. Refer Instruction Manual for detailed information. | | | | | | | | | | | | | | | | | |
| Operation Specifications | Current feed back & Thermal OLR | Motor current: Adjustable down to 30% of Unit Current Rating I-Low Level : 0 ~ 100% of full load motor current I-Low Time : 0 ~ 20 minutes I-Limit Level : 100 ~ 500% of full load motor current I-Limit Time : 10 ~ 60 seconds I-Trip Level : 100 ~ 550% of full load motor current | | | | | | | | | | | | | | | | | |
| | Input Signals (Analog) | 0 ~ 10 V programmable analog inputs (02, 12-bit) 4 ~ 20 mA programmable analog inputs (02, 12-bit) | | | | | | | | | | | | | | | | | |
| | Digital Input Signals | 8 programmable digital inputs, sink or source logic selectable (max. 5 mA) | | | | | | | | | | | | | | | | | |
| | Output Signals (Form C Relay output contacts) | Programmable Relay 1: 1 NO, 1 NC rated 2 A @ 240 VAC Programmable Relay 2: 1 NO, 1 NC rated 2 A @ 240 VAC Programmable Fault Relay: 1 NO, 1 NC rated 2 A @ 240 VAC | | | | | | | | | | | | | | | | | |
| | Output Signals (Open collector type) | Programmable Sequence Output 1~4 (max. 50 mA / 30 VDC each) | | | | | | | | | | | | | | | | | |
| | Output Signals (Analog) | 0~10V programmable analog outputs (02, 12-bit) 4~20mA programmable analog outputs (02, 12-bit) | | | | | | | | | | | | | | | | | |
| | Start Mode | V-Ramp Start | Dual Ramp Selection Pedestal-1: 25 ~ 90% Kick start voltage: 0 ~ 90% | | | | | | V-Ramp Up Time 1: 1 ~ 240 sec Kick start Time: 0 ~ 2.0 sec Target Voltage : 25 ~ 100% | | | | | | | | | | |
| | | I-Ramp Start | I-Ramp Up Time: 1 ~ 60 sec I-Proportional Gain: 0.01 ~ 2.00 | | | | | | Initial Current: 100 ~ 300%. I-Integral Time: 0.01 ~ 100.00 | | | | | | | | | | |
| | | T-Ramp Start | T-Ramp Up Time: 1 ~ 240sec Torque Limit: 1 ~ 250% T-Integral Time: 0.01 ~ 100.00 | | | | | | Initial Torque: 1 ~ 250% T-Proportional Gain: 0.1 ~ 2.0 | | | | | | | | | | |
| | Stop Mode | V-Ramp Stop | V-Ramp Down Time: 1 ~ 240 sec Final voltage: 70 ~ 25% | | | | | | Initial Voltage: 100 ~ 20% | | | | | | | | | | |
| Brake Stop | | Brake Ramp Time: 0.1 ~ 20.0 sec Brake Time: 1 ~ 240 sec | | | | | | Brake Voltage: 25 ~ 100% | | | | | | | | | | | |
| T-Ramp stop | | T- Ramp Down Time: 1 ~ 240 sec | | | | | | End Torque: 1 ~ 100% | | | | | | | | | | | |
| Coast-to-stop | | | | | | | | | | | | | | | | | | | |
| Control Mode | Local (Digital Operation Panel) • Terminal • Serial interface with RS-485 Modbus Communication | | | | | | | | | | | | | | | | | | |
| Start Duty | Ten equally spaced starts per hour at 300% current, each of 30 seconds duration, separated by periods of 100% current, or one start at 300% current of 60 seconds duration, followed by 100% current indefinitely (for models 400~710 kW, 6 equal starts). | | | | | | | | | | | | | | | | | | |
| Display | Display and Keypad module | • 80-Character, 4-Line backlit LCD panel, 8-Key keypad • 3-Status indicating LEDs (for Run, Stop and Fault) | | | | • Input Frequency • Motor Current (each phase) • Reactive Power • Energy Meter-kWH/MWH | | | | • Input Voltage • Active Power • Power Factor • Peak Current | | | | • Motor Voltage • Motor Torque | | | | | |
| Protection | Diagnostic Fault Protection | • Over current fault • Over load fault • Ground fault • Phase Loss fault • Over voltage fault | | | | • Under voltage fault • Temperature fault • Phase direction fault • I-Unbalance fault • Firing fault | | | | • Over frequency fault • Under frequency fault • Emergency Stop • Main Contactor fault • Bypass Contactor fault | | | | • Communication loss • External fault • EEPROM fault • Under current fault | | | | | |
| Environment | Installation Location Ambient Temperature Storage Temperature Altitude (above sea level) Humidity Enclosure | Indoor 0~50°C (122°F) -20°C (-4°F) ~70°C (158°F) 1000 m (3300 ft) without derating, above this derate 5% per 305 m (1000 ft) 0~95% max non condensing IP00 as standard, other can be provided on demand | | | | | | | | | | | | | | | | | |
| Other | Complete I/O Interface | • 4 Analog Inputs • 4 Analog Outputs | | | | • 8 Digital Inputs • 7 Digital Outputs | | | | • RS-485 Modbus Communication | | | | | | | | | |



Note:- * Bypass contactor is optional. Ⓢ Control supply 230 VAC to be provided by customer. 115 VAC for UL model. Refer instruction manual for ordering code

Outline Dimensions



| Model: AMT-OT- XXX-4-X | Dimensions in mm (inch) | | | | | | | | Weight in kg (lb) |
|------------------------------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|----------------------|
| | A | B | C | D | E | F | G | H | |
| 030 | | | | | | | | | |
| 037 | 445 | 213 | 260 | 170 | 423 | 43 | 43 | 77 | 13 |
| 045 | (17.5) | (8.4) | (10.2) | (6.7) | (16.7) | (1.7) | (1.7) | (3.0) | (28.7) |
| 055 | | | | | | | | | |
| 075 | 460 | 213 | 277 | 170 | 438 | 43 | 43 | 92 | 20 |
| 090 | (18.1) | (8.4) | (10.9) | (6.7) | (17.2) | (1.7) | (1.7) | (3.6) | (44.1) |
| 110 | | | | | | | | | |
| 132 | 420 | 328 | 315 | 224 | 400 | 102 | 98 | 227 | 29 |
| 160 | (16.5) | (12.9) | (12.4) | (8.8) | (15.8) | (4.0) | (3.9) | (8.9) | (64) |
| 200 | | | | | | | | | |
| 250 | 600 | 547 | 326 | 442 | 570 | 210 | 210 | 358 | 60 |
| 315 | (23.6) | (21.5) | (12.8) | (17.4) | (22.4) | (8.27) | (8.27) | (15.2) | (132.3) |
| 400 | | | | | | | | | |
| 450 | 740 | 597 | 326 | 492 | 710 | 235 | 235 | 525 | 78 |
| 500 | (29.1) | (23.5) | (12.8) | (19.4) | (28) | (9.3) | (9.3) | (20.7) | (172) |
| 585 | | | | | | | | | |
| 630 | | | | | | | | | |
| 710 | Consult factory for the dimensions | | | | | | | | |

Traditional Methods of Starting AC Induction Motors

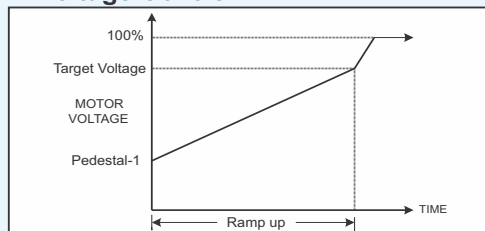
| | STARTING METHOD | | | | |
|------------------------------|----------------------|------------|------------------|---------------------------|---------------------------|
| | DIRECT ON-LINE (DOL) | STAR-DELTA | AUTO-TRANSFORMER | SWITCHED ROTOR RESISTANCE | SOLID STATE SOFT-STARTING |
| MOTOR CONNECTION | | | | | |
| CURRENT SPEED CHARACTERISTIC | | | | | |
| TORQUE-SPEED CHARACTERISTIC | | | | | |

AXPERT-OPTI torque

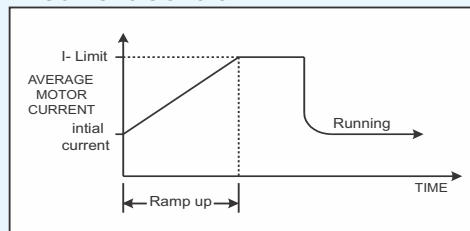
STARTING INDUCTION MOTORS

Three Starting Modes

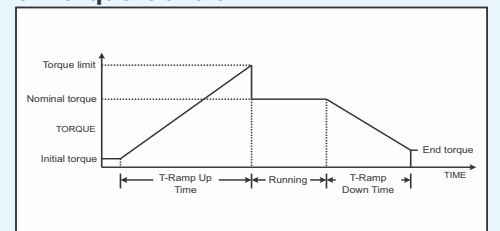
1. Voltage Control



2. Current Control



3. Torque Control



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- Apxert-Opti torque Soft Starter
- Apxert-Eazy HF-High Frequency Drive

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- Retrofit solutions

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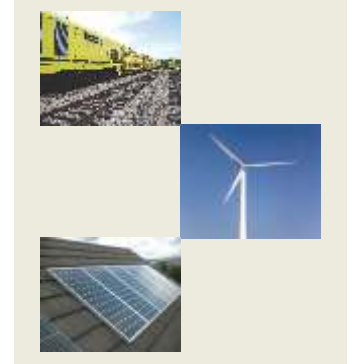
Products

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- Harmonic Reactor
- Static Harmonic Converter
- EMI/RFI Filter
- Sinus Filter
- Active Front end Converter

Services

- Harmonic Audit and Solutions to comply with IEEE-519 standard
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- Consultancy for Power Quality improvement
- Training on Power Quality Management
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- Retrofit Solutions



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