

Page 5-4

ADXC

- Two phase control
- IEC rated starter current Ie 12...45A
- IEC rated motor power 5.5...22kW at 400VAC and 9...37kW at 600VAC
- UL/CSA ratings 3 to 25HP at 400VAC and 10 to 40HP at 600VAC
- Built-in bypass relay
- Total protection against over temperature and wrong phase sequence
- Initial voltage, ramp up and ramp down time adjustable on front
- LED indication for starter status
- DIN rail mount and only 45mm wide.



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ADXL...

- Two phase control
- Reduced voltage starter with torque control and built-in bypass relay
- For standard and severe duty
- Rated operational voltage 208...600VAC
- IEC rated starter current Ie 30....320A
- IEC rated motor power 15...160kW (400VAC); 18.5...200kW (500VAC)
- UL/CSA rated motor power 15...200HP (380-415VAC); 25...300HP (550-600VAC)
- Maximum starting current limitation
- PC remote control
- Programming, data download and diagnostics via optical port
- Parameter programming via NFC
- Modbus-ASCII, Modbus-RTU and Modbus-TCP communication protocols
- Backlit LCD display.



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ADX...

- Three phase control
- Reduced voltage starter with torque control and built-in bypass contactor up to 245A
- For severe duty, IEC starting current 5•Ie
- Rated operational voltage 208...500VAC (ADX...B) 208...415VAC (ADX...)
- IEC rated starter current Ie 17...1200A
- IEC rated motor power 7.5...710kW (400VAC)
- Maximum starting current limitation
- PC remote control supervision
- Modbus-RTU and property ASCII communication protocols
- Backlit LCD display.

Guide for selecting the best device

	ADXC	ADXL	ADX
Controlled phases	2	2	3
Built-in bypass	●	●	● (up to 245A)
Built-in display and keypad	—	●	●
Languages	—	6	4
View measurements	—	●	●
Torque control	—	●	●
Adjustable current limit	—	●	●
Dynamic braking	—	—	●
Kick Start function	—	●	●
Motor overload electronic protection	—	●	●
Motor protection PTC input	—	●	●
Protection against phase reversal	●	●	●
Protection against phase inversion	●	●	●
Protection against locked rotor	—	●	●
Protection against thyristor overtemperature	●	●	●
Protection against low load	—	●	●
Programmable alarm functions	—	●	●
Programmable digital inputs	—	●	●
Programmable analog inputs	—	○	●
Programmable digital outputs	—	●	●
Programmable analog output	—	○	●
Monitoring communication via RS485	—	○	●
Programming communication	—	●	●
Event log	—	●	●
Motor hour counter	—	●	●
Startup counter	—	●	●
Clock calendar	—	—	●
Remotable external keypad	—	○	○

● Standard
○ Optional
— Not available



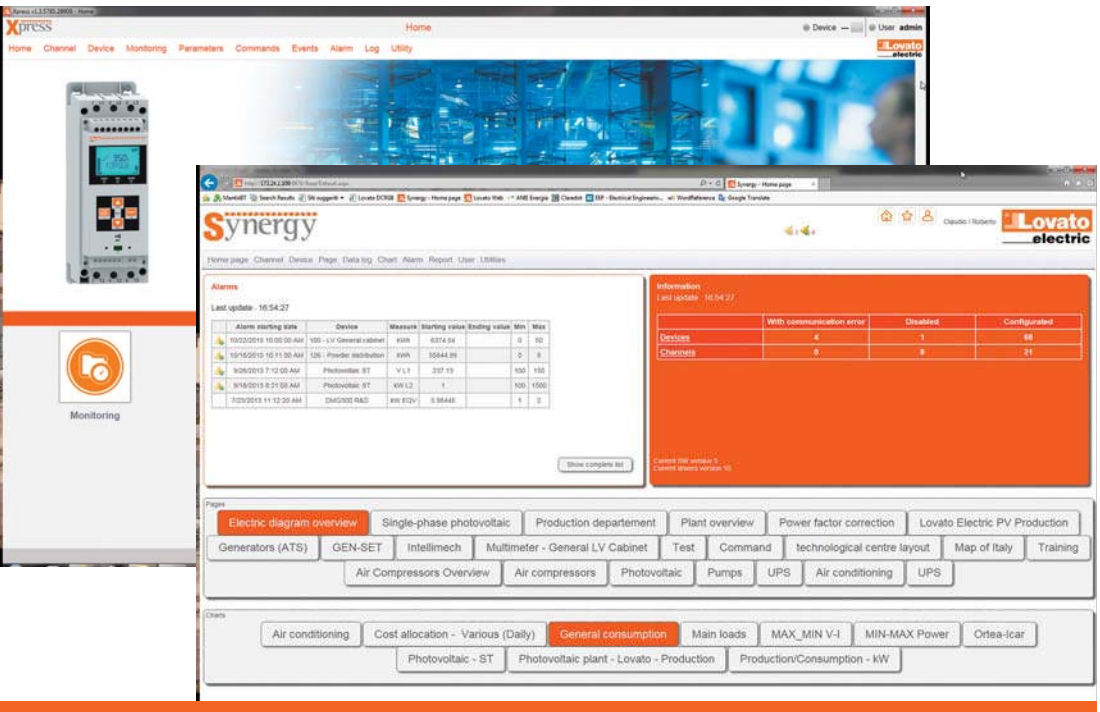
- 12A to 1200A soft starter ratings
- Standard and severe duty types
- Internal bypass contactor up to 320A rating
- Startup with torque control, voltage ramp or current limit
- Integrated total motor protection
- Clock calendar
- Digital control and adjustment
- RS232 and RS485 for monitoring and remote control
- Modbus-RTU and proprietary ASCII communication protocols.

SEC. - PAGE

Soft starters

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ADXL SERIES
SIMPLE, EFFICIENT AND SAFE MOTOR CONTROL



SIMPLE
The new ADXL soft starter series is equipped with a backlit LCD display with icons and NFC connectivity, for a simple configuration, possible also via smartphones and tablets. They are ideal for simple "plug and play" applications, thanks to the installation AUTO SET wizard, and for high-performance applications, with control and protection during the motor startup and operation.

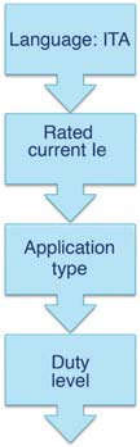
EFFICIENCY
After the start-up is completed, the soft starter closes the internal bypass contacts and reduces energy consumption.

SAFETY
ADXL built-in functions allow to protect the connected motor and the starter; it's capable of monitoring the motor thermal status, to manage the thermal protection, and its internal temperature, in order to protect the SCR from overtemperature. Furthermore, a motor overtemperature protection can be enabled through an external PTC temperature sensor.

AUTO SET
Upon startup, the soft starter launches a user wizard to simplify the setup. The user can set the device through 4 simple parameters:
- **language:** it is possible to choose the text view by selecting the preferred language. The available languages are: English, Italian, French, Spanish, Portuguese, German;
- **motor current size:** the motor nominal current (can be set between 50 and 100% of the starter size);
- **application type:** it includes predefined setups for the most common applications: centrifugal pump, fire pump, conveyor belt, fan, mixer and general purpose. By selecting one type, the soft starter automatically updates the parameter programming to adapt to the requested application.
- **soft starter duty level:** the same application, based on the load connected to the motor, can be more or less heavy-duty. ADXL is capable of automatically adapting to standard or heavy-duty startups by adjusting the related parameters based on the user selection.

Expert users can customize the settings through the complete parameter menu.

ADXL: from start-up to operation in 4 steps

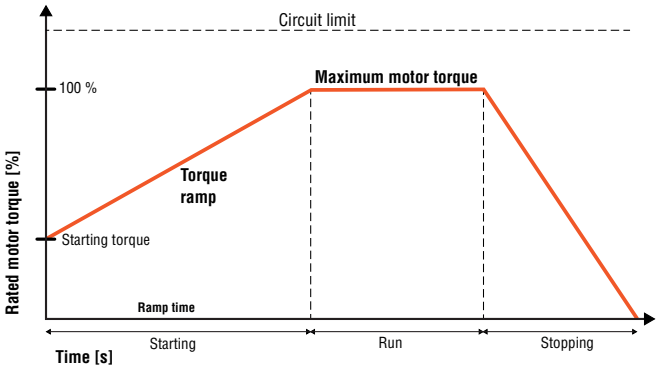


EASY SETUP
The ADXL series soft starters are equipped with NFC technology to simplify the parameter setting procedure. Using a compatible smartphone or tablet, the user, even with the soft starter turned off, can download, save and edit the parameter menu using the LOVATO NFC configurator app. The device front includes an optical port compatible with the CX01 dongles, to connect via USB it to the PC through the Xpress software, and the CX02 dongles, for Wi-Fi connection to the PC or the Sam1 app.



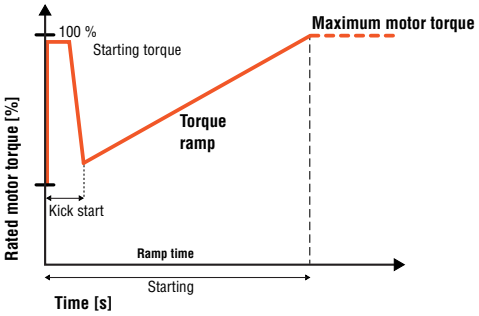
TORQUE CONTROL

The new two-phase control range includes the torque control. This motor starter solution allows to perform gradual accelerations and decelerations, with consequent significant reduction of mechanical faults and wear of the transmission devices.



KICK START

This function allows to start the motor when the initial torque is not sufficient to overcome friction forces; it transmits a high torque during the very first moments of the startup.



FIRE PUMP PRESET SETUP

While choosing the application in the AUTO SET wizard, it's possible to select the fire pump function. This parameter setting is optimized to start fire pumps overriding all alarms and protections. In this situation, the main priority is the pump start-up, without considering the possible consequences for the pump starter and motor.

INPUTS, OUTPUTS, LIMITS AND REMOTE VARIABLES

The input and output functions are preset with the most common settings; the user can easily edit the preset configuration to adapt the soft starter to the application needs. All inputs and outputs can be edited. There are three types of programmable internal variables:
– limit thresholds;
– remote variables;
– user alarms.

MAINTENANCE COUNTERS

ADXLs have two counters dedicated to count the number of start-ups and the motor operation hours. It is possible to set a threshold for the operation hours; when this threshold is exceeded, a dedicated alarm is triggered.

COOLING FAN

The fan is supplied as an accessory for sizes from 30 to 115A, while it is built-in for all larger sizes. In order to increase its life span, the fan is activated only when necessary. Furthermore, the ADXL is capable of checking the fan conditions; any blocks or faults are signalled through two specific alarms.

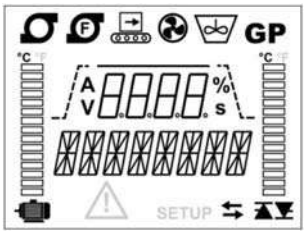
DIN MOUNT GUIDE

For sizes from 30 to 115A, the EXP8003 accessory is available to mount the soft starter on a 35mm DIN rail.



USER INTERFACE

A backlit icon display shows the data to the user in a clear and immediate way.
- Alarm texts available in 6 languages (ENG-ITA-FR-ES-POR-DE)
- 6 icons indicate the default setup in use: centrifugal pump, fire pump, conveyor belt, fan, mixer and general purpose;
- Two graphic bars show the motor and thyristors temperature;
- Two alphanumeric displays allow to view texts and measures;
- A status bar shows the starter, start, bypass, stop status.



PASSWORD

Access to the soft starter parameters can be protected by user customizable passwords. There are two access levels, user and advanced.
Furthermore, it's possible to block the serial communication using the remote control password.

RS485 COMMUNICATION AND REMOTE KEYPAD

All ADXL series soft starters are equipped with a slot to house the EXC1042 MiniCard, an expansion dedicated to the RS485 communication. RS485 communication can be used to connect the EXCRDU1 remote keypad, to view the measures or to perform the setup through the touch screen installed on the front panel.



MONITORING AND REMOTE CONTROL

Through the optional EXC1042 communication module and compatibility with the supervision and energy management software Synergy, setup and remote control software Xpress, it's possible to constantly monitor all the measures available on the Modbus, the soft starter status and edit the setup parameters.



ADXC type



ADXC 012…
ADXC 032…



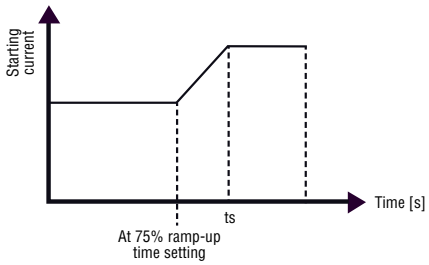
ADXC 037…
ADXC 045…

Order code	IEC rated starter current Ie	Rated motor power ≤40°C ❶ IEC	UL/CSA	Qty per pkg	Wt
	[A]	[kW]	[HP]	n°	[kg]
With built-in bypass relay. Three-phase 400VAC motor control. Auxiliary supply: starter 110…400VAC (L1-L2-L3 inputs); start command 110...400VAC (A1-A2 terminals).					
ADXC 012 400	12	5.5	5	1	0.500
ADXC 016 400	16	7.5	7.5	1	0.500
ADXC 025 400	25	11	10	1	0.500
ADXC 032 400	32	15	15	1	0.500
ADXC 037 400	37	18.5	20	1	0.700
ADXC 045 400	45	22	25	1	0.700
With built-in bypass relay. Three-phase 400VAC motor control. Auxiliary supply: starter 110…400VAC (L1-L2-L3 inputs); start command 24VAC/DC (A1-A2 terminals).					
ADXC 012 400 24	12	5.5	5	1	0.500
ADXC 016 400 24	16	7.5	7.5	1	0.500
ADXC 025 400 24	25	11	10	1	0.500
ADXC 032 400 24	32	15	15	1	0.500
ADXC 037 400 24	37	18.5	20	1	0.700
ADXC 045 400 24	45	22	25	1	0.700
With built-in bypass relay. Three-phase 600VAC motor control. Auxiliary supply: starter 100…240VAC (A1-A2 separate 1-phase); start command 100...240VAC (ST terminals). With 2 relay outputs.					
ADXC 012 600 R2	12	9	10	1	0.500
ADXC 016 600 R2	16	11	15	1	0.500
ADXC 025 600 R2	25	20	20	1	0.500
ADXC 032 600 R2	32	22	30	1	0.500
ADXC 037 600 R2	37	30	30	1	0.700
ADXC 045 600 R2	45	37	40	1	0.700

❶ For operating temperature higher than 40°C, derate starter power; see values given in the technical characteristics on page 5-13, in Rated current In per IEC/FLA current per UL.

Current control

ADXC… gradually increases the current limit at 75% ramp-up time if the motor speed has yet to reach rated value, to avoid locked rotor state before time elapsing.

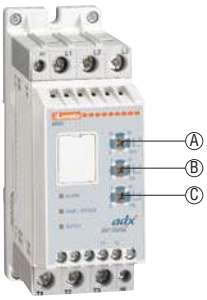


Typical settings

The following settings are standard ones for the different applications; they are for indication and reference purposes only.
After the installation, it is recommended to always parameterise the soft starter with the motor connected to find the best settings and then test it.
Initial voltage adjustment is the first operation followed by the ramp-up time setting and the ramp-down time is last, if any is required.

Type of application	Initial voltage	Accel. time	Decel. time
	[%]	[s]	[s]
Hydraulic lift	40	2	0
Piston compressor	40	3	0
Screw compressor	50	10	0
Scroll compressor (with revolving spiral)	40	1	0
Low inertia fan	40	10	0
High inertia fan	40	15-20	0
Pump	40	10	10
Centrifugal blower	40	5	0
Conveyor	50	1	5

ADXC… adjustments



Ⓐ Initial voltage: 0-85% of the motor control power.
Ⓑ Ramp up time: 1-20 seconds. Initial to maximum load voltage time.
Ⓒ Ramp down time: 0-20 seconds. Maximum to no load voltage time.

General characteristics

ADXC… is a compact type of soft starter, 45mm wide and easy to use, for three phase squirrel-cage induction motors; soft starts and soft stops rated motor load currents up to 45A.
It is based on a current limiting starting methodology to limit the maximum starting current. ADXC… reduces the mechanical stress on motor shafts, gearboxes and drive belts.
Ramp up, ramp down and initial voltage time settings can be independently adjusted by built-in potentiometers.
Main features are:
- For three phase induction motors up to 22kW / 25HP at 400VAC and 37kW / 40HP at 600VAC
- Maximum input voltage: 400VAC 50/60Hz for ADX… 400…; 600VAC 50/60Hz for ADXC…600…
- Built-in bypass relay
- Wrong phase sequence and over temperature protection
- Alarm for wrong phase sequence; line voltage and/or frequency out of limits (over and undervoltage); overcurrent, over temperature, irregular ramp up and current flow during bypass; motor voltage unbalance
- Simple setup and installation
- 2 relay outputs for alarms (NC) and bypass closing (NO) for ADXC…600 R2
- 35mm DIN rail mounting (IEC/EN 60715)
- Ideal for hydraulic lifts, conveyor belts, compressors, pumps, hoisting devices, blowers, fans, mixers.

Operational characteristics

- Two phase control
- Input voltage L1-L2-L3:
  - 220...400VAC -15%...+10% for ADXC…400 and ADXC…400 24
  - 220...600VAC -15%…+10% for ADXC…600 R2
- Frequency range: 50/60Hz ±10% self-configurable
- Self powered for ADXC…400… types
- Separate single phase auxiliary power supply A1-A2: 100...240VAC -15%...+10% for ADXC…600 R2
- Start command:
  - A1-A2 24VAC/DC -15%…+10% (ADXC…400 24)
  - A1-A2 110…400VAC -15%...+10% (ADXC…400)
  - ST 100…240VAC -15%...+10% (ADXC…600 R2)
- Ramp up time: 1-20 seconds
- Ramp down time: 0-20 seconds
- Initial voltage: 0-85%
- 3 indication LEDs “alarm” (red – alarm conditions with diverse number of flashes), “ramp/bypass” (yellow – flashing in ramp phase / constantly on with bypass relay connected) and “supply” (green – constantly on with power supply flow)
- Degree of protection: IEC IP20.

Certifications and compliance

Certifications obtained: UL Listed for USA and Canada (cULus – File E223223) under Solid State Motor Controllers as reduced voltage starters; EAC and CCC pending completion at time of catalogue printing.
Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-2, UL 508, CSA C22.2 n°14.

ADXL... types



NFC

new

ADXL 0030 600...ADXL 0060 600



ADXL 0075 600...ADXL 0115 600



ADXL 0135 600...ADXL 0162 600

Order code	IEC rated starter current Ie	Rated motor power ≤40°C IEC (400V)		Qty per pkg	Wt
	[A]	[kW❷]	[HP]	n°	[kg]
For standard and heavy-duty applications. With built-in bypass relay. Auxiliary supply: 100...240VAC. Rated operational voltage 208...600VAC					
ADXL 0030 600	30	15	20	1	2.100
ADXL 0045 600	45	22	30	1	2.100
ADXL 0060 600	60	30	40	1	2.100
ADXL 0075 600	75	37	50	1	2.900
ADXL 0085 600	85	45	60	1	2.900
ADXL 0115 600	115	55	75	1	2.900
ADXL 0135 600	135	75	100	1	❶
ADXL 0162 600	162	90	125	1	❶
ADXL 0195 600	195	110	150	1	❶
ADXL 0250 600	250	132	200	1	❶
ADXL 0320 600	320	160	250	1	❶

❶ Contact our Customer Service office; see contact details or inside front cover.

IEC ratings ≤40°C (50Hz)

Order code	Starter current Ie	Motor power ❷		
		230V	400V	500V
	[A]	[kW]	[kW]	[kW]
ADXL 0030 600	30	7.5	15	18.5
ADXL 0045 600	45	11	22	30
ADXL 0060 600	60	15	30	37
ADXL 0075 600	75	22	37	45
ADXL 0085 600	85	22	45	55
ADXL 0115 600	115	37	55	75
ADXL 0135 600	135	37	75	90
ADXL 0162 600	162	45	90	110
ADXL 0195 600	195	55	110	132
ADXL 0250 600	250	75	132	160
ADXL 0320 600	320	90	160	200

IEC ratings ≤40°C (60Hz)

Order code	Starter current FLA	Motor power ❸				
		208V	220-240V	380-415V	440-480V	550-600V
	[A]	[HP]	[HP]	[HP]	[HP]	[HP]
ADXL 0030 600	28	10	10	15	20	25
ADXL 0045 600	44	10	15	25	30	40
ADXL 0060 600	60	20	20	30	40	50
ADXL 0075 600	75	25	25	40	50	60
ADXL 0085 600	83	25	30	50	60	75
ADXL 0115 600	114	40	40	60	75	100
ADXL 0135 600	130	40	50	75	100	125
ADXL 0162 600	156	50	60	75	125	150
ADXL 0195 600	192	60	60	100	150	200
ADXL 0250 600	248	75	100	150	200	250
ADXL 0320 600	320	100	125	200	250	300

❷ Preferred rated values according to IEC 60072-1 (primary series).
❸ Horsepower and currents values according to UL 508 (60Hz).

General characteristics
The new series of ADXL soft starters allow control the start and stop of three-phase asynchronous motors on two-phases with built-in bypass. ADXLs are equipped with a backlit display with icons and NFC technology, for a simple configuration, possible also from smartphones and tablets. ADXLs are ideal for simple "plug and play" applications, thanks to the installation wizard, and for high-performance applications, with control and protection during the motor start-up and operation. The ADXLs include protection features for the starter and motor, and it's possible to enable specific alarms to signal maintenance needs, such as the number of startups performed or the operation hours of the motor.

It has the following main features:
- Backlit LCD display
- Texts available in 6 languages (ENG-ITA-FR-ES-POR-DE)
- IEC rated starter current Ie from 30 to 320A
- IEC rated motor power 15...160kW (400VAC) and 18.5...200kW (500VAC)
- UL/CSA rated motor power 15...200HP (380-415VAC) and 25...300HP (550-600VAC)
- Voltage ramp startup
- Torque control
- Kick start
- Limited maximum starting current
- Free wheel or controlled stop
- Built-in bypass relay
- Optical port for programming data download and diagnostics through the software Xpress and app Sam1
- NFC technology for parameter programming through the app NFC
- Optional RS485 communication
- Modbus-ASCII, Modbus-RTU and Modbus-TCP communication protocols
- Supervision and energy management software Synergy.

Operational characteristics
- Two phase control
- Input voltage: 208...600VAC ±10%
- Network frequency 50 or 60Hz ±10% self-configurable
- 100...240VAC auxiliary power supply
- Signalling LED: power supply startup or bypass phase, alarm
- Three programmable outputs: 1 changeover contact 2 normally open contacts
- 2 programmable digital inputs
- 1 programmable digital input, that can be used as PTC
- Protection rating: IP00.

Displayed measures:
Maximum current, L1 current, L2 current, L3 current, %-torque, average line voltage, total active power, total PF, motor thermal status, starter temperature.

Protections
- Motor: thermal protection, PTC protection, locked rotor, current asymmetry, startup too long, minimum torque
- Power supply: no power supply, phase loss, wrong phase sequence and out-of-range frequency
- Starter: overtemperature, overcurrent, SCR fault, bypass relay fault, temperature sensor fault and fan fault.

Certifications and compliance
Certificates pending: cULus; EAC.
Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-2, UL508, CSA C22.2 n° 14.

ADX type



51 ADX 0017B…51 ADX 0045B



51 ADX 0060B…51 ADX 0085B



51 ADX 0110B…51 ADX 0125B

Order code	IEC rated starter current Ie	IEC rated motor power ≤40°C IEC 440V	UL508 440/ 480V	Qty per pkg	Wt
	[A]	[kW]	[Hp]	n°	[kg]
For standard duty (starting current 5•Ie). With built-in bypass contactor. Auxiliary supply: starter Us 208...240VAC; start command 24VDC					
51 ADX 0017B	17	7.5	10	1	7.900
51 ADX 0030B	30	15	20	1	8.000
51 ADX 0045B	45	22	30	1	8.300
51 ADX 0060B	60	30	40	1	14.900
51 ADX 0075B	75	37	50	1	14.900
51 ADX 0085B	85	45	60	1	14.900
51 ADX 0110B	110	55	75	1	15.700
51 ADX 0125B	125	55	100	1	15.700
51 ADX 0142B	142	75	100	1	34.000
51 ADX 0190B	190	90	150	1	37.000
51 ADX 0245B	245	132	200	1	37.000
For severe duty (starting current 5•Ie). Predisposed for external bypass contactor. Auxiliary supply: starter Us 208...240VAC; start command 24VDC					
51 ADX 0310	310	160	250	1	50.000
51 ADX 0365	365	200	300	1	50.000
51 ADX 0470	470	250	400	1	90.000
51 ADX 0568	568	315	450	1	90.000
51 ADX 0640	640	355	500	1	110.000
51 ADX 0820	820	400	600	1	170.000
51 ADX 1200	1200	710	900	1	185.000

General characteristics
ADX... is a three-phase control soft starter used to start and gradually stop three-phase asynchronous squirrel-cage motors. The startup can be performed through a voltage ramp with torque control and limitation of the maximum startup current.
The integrated bypass contactor (only for ADX...B types) drastically limits dissipation, as a result, equipment for electric panel cooling ventilation can be eliminated and the enclosure size can be reduced as well. It's equipped with RS232 and RS485 interfaces.

CONTROL
During starting: Torque control acceleration, current limit control and booster.
During stopping: Torque control deceleration, dynamic braking and free-wheel.
In emergency conditions: Starting without protection direct-on-line starting using integrated bypass contactor.
Remote control: PC supervision by connection with RS232/RS485 converter, modem or GSM modem.
Automatic call function (Autocall) in case of alarm conditions by sending a message to a cellular phone (SMS-Short Message Service) and/or to a mailbox.
Proprietary ASCII and Modbus-RTU communication protocols.

KEYPAD OPERATIONS
- Backlit LCD 2-line 16-character display
- Multilanguage capability (Italian, English, French, Spanish)
- Basic, advanced and function programming menus
- Keypad stop and start
- Motor and mains parameter readings:
  - line voltage values (L-L)
  - phase current
  - active and apparent power values per phase
  - power factor per phase
  - kWh
- Time sequential events log
- Clock calendar with backup battery.

PARTICULAR FUNCTIONS
Digital inputs and programmable relay outputs. Analog input (0...10V, 0...20mA or 4...20mA) for ramp acceleration and/or deceleration, motor start and stop control thresholds, programmable relay enable and disable control thresholds. Analog output (0...10V, 0...20mA or 4...20mA) for current, torque, motor thermal status and power factor readings.
Input programming for second motor.

PROTECTION
- Motor: Dual thermal protection class (one during starting phase and the other during running) or by PTC sensor, locked rotor, current asymmetry, minimum torque and starting time too long
- Auxiliary voltage: Voltage value too low
- Power voltage: Phase failure, phase sequence and frequency out of limits
- Control inputs and analog output: Static 24VDC short-circuit protection with automatic resetting.
- Starter: Overcurrent, high temperature, SCR and bypass contactor malfunction.

Operational characteristics
- Three phase control
- Input voltage:
  - 208...500VAC ±10%❶ (ADX...B)
  - 208...415VAC ±10%❷ (ADX...)
- Mains frequency: 50/60Hz ±5%
- Auxiliary supply voltage: 208...240VAC ±10%
- Auxiliary consumption: 20VA
- Rated starter current Ie:
  - 17A...245A (ADX...B)
  - 310A...1200A (ADX...)
- Motor current: 0.5...1 Ie
- Overload current:
  - 105% Ie for ADX...B
  - 115% Ie for ADX...

Certifications and compliance
Certifications obtained: EAC for all; CCC for ADX 0110B and ADX 0125B types only.
Compliant with standard: IEC/EN 60947-1, IEC/EN 60947-4-2.

❶ 208-600VAC ±10% on request.
❷ Voltages on request: higher than 415V to 690V maximum.

Accessories for ADXL... types


CX 01


CX 02


EXC RDU1


EXC 1042


EXP 8003

Order code	Description	Qty per pkg	Wt
		n°	[kg]
CX 01	USB connection dongle PC ↔ ADXL with optical connector for programming, data download, diagnostics and firmware update	1	0.090
CX 02	Wi-Fi connection dongle PC ↔ ADXL for data download, programming, diagnostics and cloning	1	0.090
EXC RDU1	Remote keypad, LCD display with touchscreen, 128 x 112 pixel, IP65 protection, 3m cable	1	0.360
EXC 1042	RS485 communication board	1	0.010
EXC CON 01	RS485/Ethernet converter, 12…48VDC, including DIN mounting guide kit	1	0.400
EXC M3G 01	RS485 gateway/3G modem, 9.5…27VAC/9.5…35VDC, including antenna and programming cable	1	0.340
EXP80 03	DIN guide mount kit for ADXL0030...ADXL0115	1	0.145
EXP80 04	Fan for ADXL0030...ADXL0115 (codes ADXL0075...ADXL0115 max. of two EXP80 04 fans)	1	0.030

Remote keypad for ADX... types


51 ADX TAST

Accessories for ADX... types


51C4


4PX1

Order code	Description	Qty per pkg	Wt
		n°	[kg]
51 ADX TAST	Remote keypad 96x96mm, 2x16 backlit LCD, 208-240VAC supply c/w 3m/10ft long connecting cable	1	0.350
31 PA 96X96	Protective cover (IP54)	1	0.077
51 C2	PC ↔ ADX connecting cable, 1.8m/6ft long	1	0.090
51 C3	PC ↔ GSM modem connecting cable, 1.8m/6ft long❶	1	0.210
51 C4	PC ↔ 4 PX1 converter drive connecting cable, 1.8m/6ft long	1	0.147
51 C5	ADX ↔ Analog modem connecting cable, 1.8m/6ft long❶	1	0.111
51 C6	ADX ↔ 4 PX1 converter drive connecting cable, 1.8m/6ft long	1	0.102
51 C7	ADX↔ GSM modem connecting cable, 1.8m/6ft long❶	1	0.101
51 C8	ADX ↔ remote keypad connecting cable, 3m/10ft long	1	0.080
4 PX1	RS232/RS485 converter drive, opto-isolated, 220...240VAC (or 110...120VAC)❷	1	0.600

❶ Consult Customer Service for modem details; see contact details on inside front cover.
❷ RS232/RS485 opto-isolated converter drive, 38,400 Baud-rate maximum, automatic or manual TRANSMIT line supervision, 220...240VAC ±10% supply (110...120VAC available on request).

General characteristics
Communication devices to connect LOVATO Electric products to:
– Personal computer (PC)
– Smartphones
– Tablets.

CX 01
This USB/optical dongle, complete with cable, allows the frontal connection of products compatible with PCs without having to disconnect the power supply from the electric panel.
The PC identifies the connection as a standard USB.

CX 02
Via Wi-Fi connection, compatible LOVATO Electric products can be viewed on PCs, smartphones and tablets with no need for cabling.

For dimensions, wiring diagrams and technical characteristics, consult the manuals available online in the Download section of the following website: www.LovatoElectric.com

EXC RDU1
Through the EXC RDU1 remote keypad, it is possible to edit the ADXL programming, view the motor measures, operational data and alarms and turn off the alarms.
– 100...240VAC / 12...24VDC double power supply
– 128x112 pixel touchscreen LCD display
– Built-in buzzer
– Static output (SSR) to signal general alarms
– Opto-isolated RS485 communication port
– Conductor cross section: 0.2...2.5mm² (24...12 AWG; 18...12 AWG for UL/CSA)
– Tightening torque: 0.56Nm (4.5lbin)
– Compatible with ADXL...
– 3m cable.

Certifications and compliance
Pending certification: cULus.
Reference standards: IEC/EN 61010-1:2001, IEC/EN 61000-6-2:2005, EN 61000-4-3:2006, EN 61000-6-3:2001, UL508, C22.2 n° 14-95.

ADX TAST remote keypad
The flush-mount ADX TAST remote keypad is identical to the one on board the soft starter except for the start and stop controls of the motor, which are permanently disabled. With this keypad, starter setup can be conducted, motor readings and operating data displayed and data and parameter transfer (ADX ↔ remote keypad) made as well.
A backup copy of the starter data and parameter setup is obtainable with the transfer functions.
It is supplied standard with a 3m long cable and suitable connectors to complete the link to the ADX RS485 port.

Advantages
– Flush mount
– Messages in selectable language
– Readings display
– Parameter setup
– Two-way data and parameter transfer.

Operational characteristics
– Auxiliary supply voltage: 208...240VAC ±10%
– Power consumption: 6.9VA
– Dissipation: 3.2W
– Mains frequency: 50/60Hz
– RS485 port: RJ4/4 connector
– Supply: Removable 3-pole 2.5 mm² terminal block.
– Display: 2 line, 16 character backlit LCD
– LED indication (3): POWER, RUN and FAULT
– Keys (6) ENTER/START, RESET/STOP, ←PREVIOUS, NEXT→, ▼ and ▲
– Ambient conditions
  • Operating temperature: -10...+60°C
  • Storage temperature: -20...+70°C
– Flush mount enclosure
– Degree of protection on front: IP41; IP54 with protective cover.

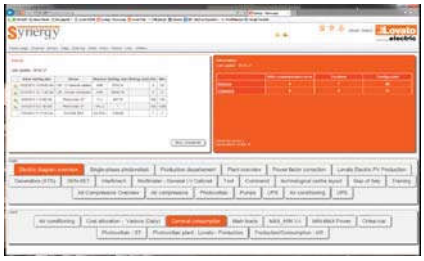
Certifications and compliance
Certifications obtained: EAC.
Compliant to standards: IEC/EN 61000-6-1 and IEC/EN 61000-6-3 for 4 PX1 types.

For ADXL...

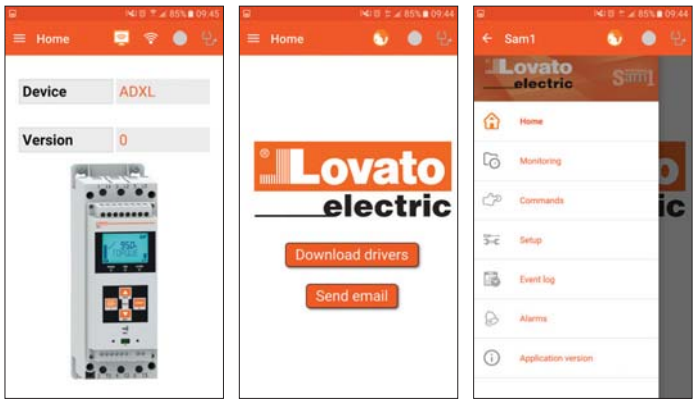
Xpress configuration and remote control software



Synergy supervision and energy management software



Sam1 APP



NFC APP



General characteristics

By using the Xpress software, the quick setup of the soft starter can be carried out via PC, avoiding possible parameter programming errors.
The parameter programming of ADXL... soft starters can also be PC saved and quickly uploaded into another device requiring the same programming.
It allows the following operations:

- Graphical and numerical display of measurements
- Soft starter status
- Access all setup parameters
- Saving / loading parameters
- Highlighting of changed values
- Resetting to default values.

Synergy software allows to remotely control and monitor the soft starters. The software structure and applications are based on MS SQL relational databases and the data can be consulted via the most common browsers. It is an extremely versatile system that can be accessed via intranet network, VPN or internet by several users/units at the same time.

For details, consult section 27 or our Customer Service office; see contact details on inside front cover.

Sam1 APP for smartphones and tablets

The application Sam1 allows the user to set the soft starter, view the alarms, send commands, read the measures, download the events and submit the data collected via e-mail. The connection is made by Wi-Fi with a smartphone or tablet using the CX 02 device.
It is iOS and Android compatible.

For details, consult section 27 or our Customer Service office; see contact details on inside front cover.

NFC APP for smartphones and tablets

The ADXL soft starters are equipped with built-in NFC technology. Using the LOVATO application NFC it is possible to program the parameters and save them on smartphones and tablets. Available only for Android devices.

For details, consult section 27 or our Customer Service office; see contact details on inside front cover.

For ADX...



51 ADX SW

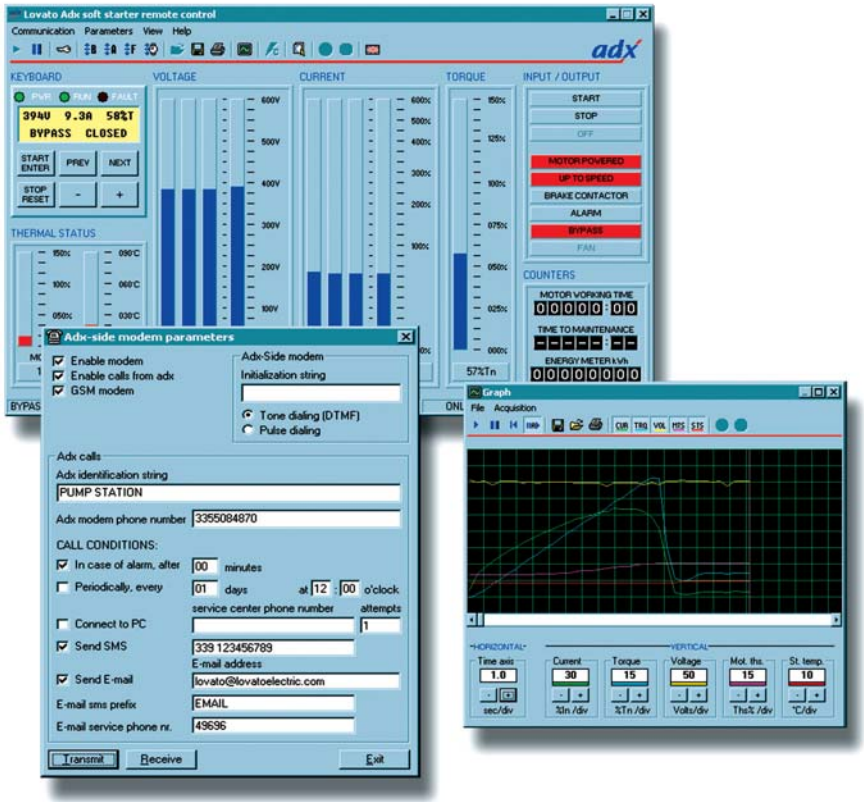
Order code	Description	Qty per pkg	Wt
		n°	[kg]
51 ADX SW	PC-ADX remote control software with proprietary ASCII and Modbus-RTU protocols and a set of connecting cables 51 C2, 51 C3, 51 C5, 51 C7 for communications via RS232 port, analog or GSM modem	1	0.550

The remote control software consents to the PC supervision of all ADX soft starter functions, including: parameter setup, real-time readout display, graphics of monitored parameter data during operation and starter events log display, each with time and date entry.
The PC-ADX connection is made by cable via the RS232 port, RS232/RS485 converter, analog or GSM modem.
The RS232 port is not suitable for permanent connections.
The connection via modem permits the ADX starter to advise alarm conditions, that is an automatic link to the remote PC.
GSM modem represents the ultimate solution for unmanned applications or where there are no telephone lines.
Interesting communication features are available with this type of modem, such as:
- SMS (Short Message Service): At alarm conditions, the ADX can send its ID and alarm code, with time and date entry. The advantage is the possibility of reaching service people, without delay, wherever they are located.
- Email (via Internet): a message with the same structure as mentioned above can be transmitted to a specified mailbox. The advantages of this type of message with respect to the SMS are that any communication, received through Internet mail server, is permanent and a vast number of these can be received and reviewed at any time.

General characteristics
- Display of all the monitored data by the ADX starter
- Virtual ADX keypad with access to all functions
- Parameter adjustment, only accessible with password, saving on disc and subsequent reloading on ADX starter
- Display of starter events log showing time and date entry
- Graphic display of monitored data during operation
- Connection through RS232/RS485 converter or modem
- GSM-modem management with SMS or e-mail transmission
- AUTOCALL function for automatic PC call
- Program configuration in 4 languages (Italian, English, Spanish and French)
- Easy installation and setup.

Advantages
- GSM network management for inaccessible applications where there are no telephone lines
- Call management during alarm conditions for SMS or email transmission
- No limit for remote control distance
- Possibility of remote motor starting
- Reduction of service time
- Reduction of maintenance and downtime.

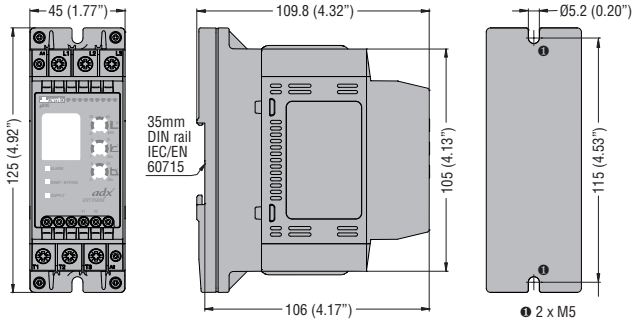
Example of main window frame using 51 ADX SW remote control software



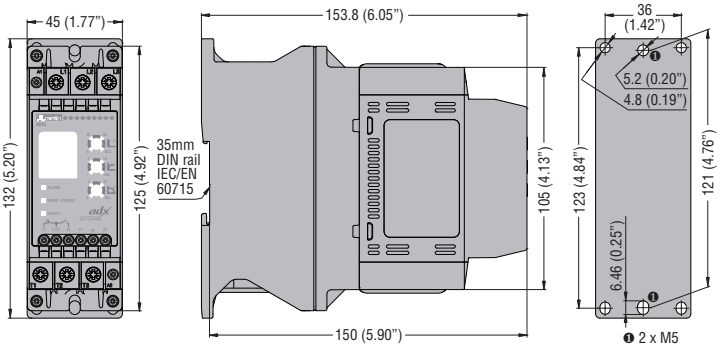
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SOFT STARTER

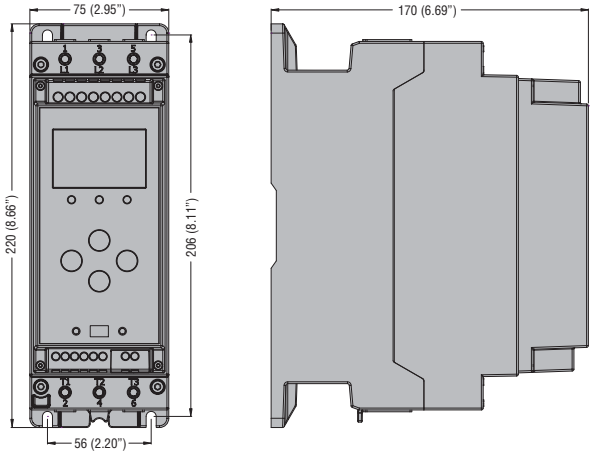
ADXC 012…ADXC 032…



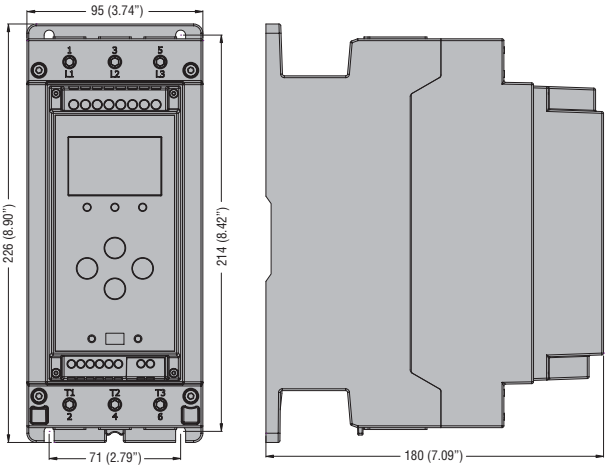
ADXC 037…ADXC 045…



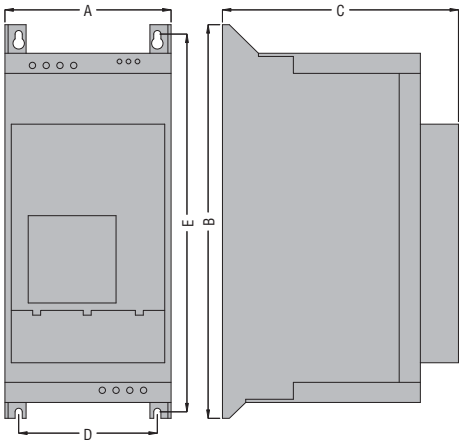
ADXL 0030 600…ADXL 0060 600



ADXL 0075 600…ADXL 0115 600

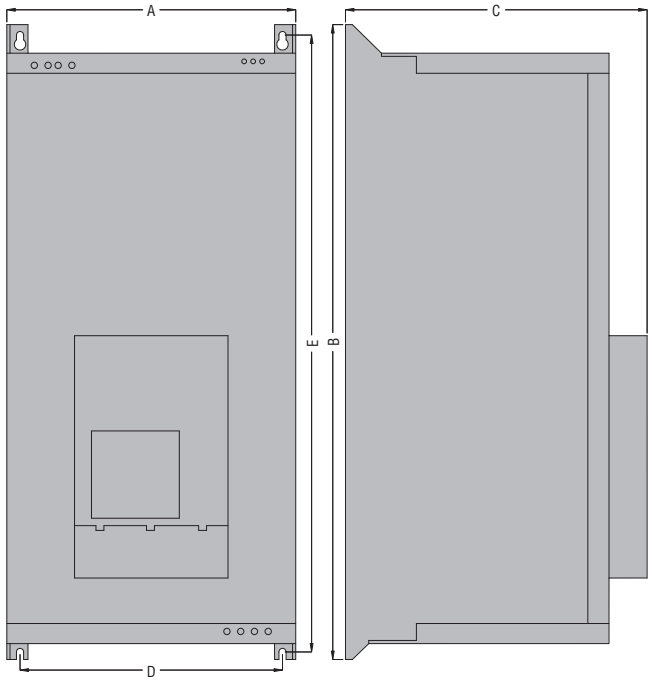


ADX 0017 B…ADX 0125 B



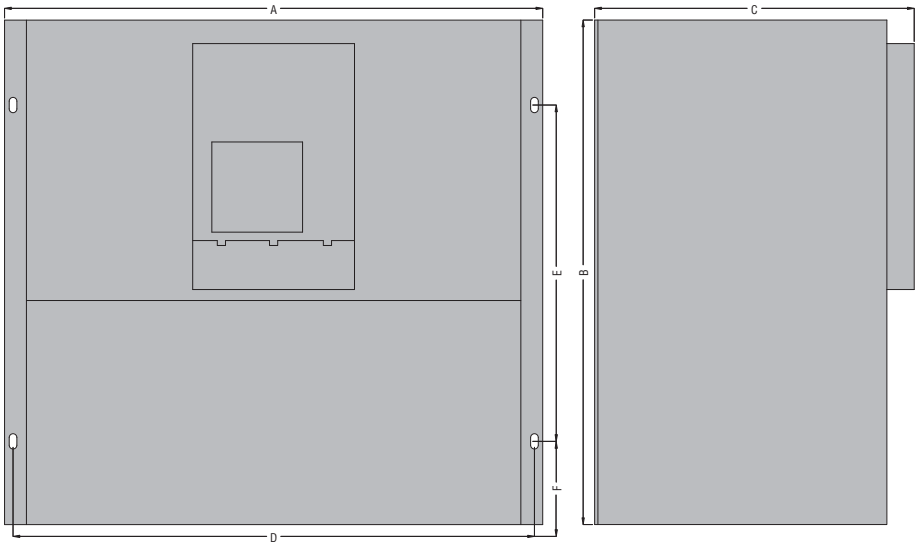
TYPE	A	B	C	D	E
ADX 0017B	157 (6.18”)	372 (14.64”)	223 (8.78”)	131 (5.16”)	357 (14.05”)
ADX 0030B	157 (6.18”)	372 (14.64”)	223 (8.78”)	131 (5.16”)	357 (14.05”)
ADX 0045B	157 (6.18”)	372 (14.64”)	223 (8.78”)	131 (5.16”)	357 (14.05”)
ADX 0060B	157 (6.18”)	534 (21.02”)	250 (9.84”)	132 (5.20”)	517 (20.35”)
ADX 0075B	157 (6.18”)	534 (21.02”)	250 (9.84”)	132 (5.20”)	517 (20.35”)
ADX 0085B	157 (6.18”)	534 (21.02”)	250 (9.84”)	132 (5.20”)	517 (20.35”)
ADX 0110B	157 (6.18”)	584 (22.99”)	250 (9.84”)	132 (5.20”)	567 (22.32”)
ADX 0125B	157 (6.18”)	584 (22.99”)	250 (9.84”)	132 (5.20”)	567 (22.32”)

ADX 0142 B…ADX 0245 B



TYPE	A	B	C	D	E
ADX 0142B	273 (10.75”)	600 (23.62”)	285 (11.22”)	230 (9.05”)	560 (25.20”)
ADX 0190B	273 (10.75”)	680 (26.77”)	310 (12.20”)	230 (9.05”)	640 (25.20”)
ADX 0245B	273 (10.75”)	680 (26.77”)	310 (12.20”)	230 (9.05”)	640 (25.20”)

ADX 0310…ADX 1200

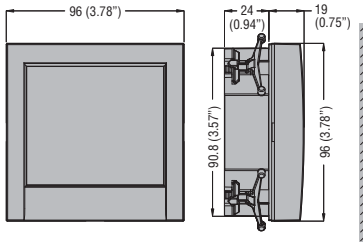


TYPE	A	B	C	D	E	F
ADX 0310	640 (25.20”)	600 (23.62”)	380 (14.96”)	620 (24.41”)	400 (15.75”)	100 (3.94”)
ADX 0365	640 (25.20”)	600 (23.62”)	380 (14.96”)	620 (24.41”)	400 (15.75”)	100 (3.94”)
ADX 0470	790 (31.10”)	650 (25.59”)	430 (16.93”)	770 (30.31”)	450 (17.72”)	100 (3.94”)
ADX 0568	790 (31.10”)	650 (25.59”)	430 (16.93”)	770 (30.31”)	450 (17.72”)	100 (3.94”)
ADX 0640	790 (31.10”)	650 (25.59”)	430 (16.93”)	770 (30.31”)	450 (17.72”)	100 (3.94”)
ADX 0820	910 (35.83”)	950 (37.40”)	442 (17.40”)	830 (32.68”)	920 (36.22”)	❶
ADX 1200	910 (35.83”)	950 (37.40”)	442 (17.40”)	830 (32.68”)	920 (36.22”)	❶

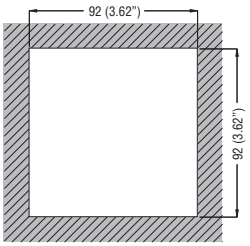
❶ Consult Customer Service; see contact details on inside front cover.

REMOTE KEYPAD

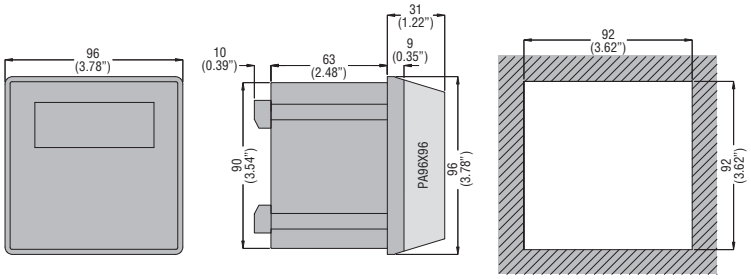
EXC RDU1



Cutout



ADX TAST

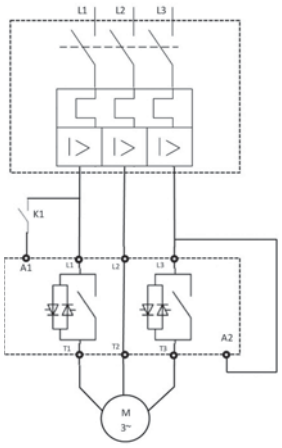


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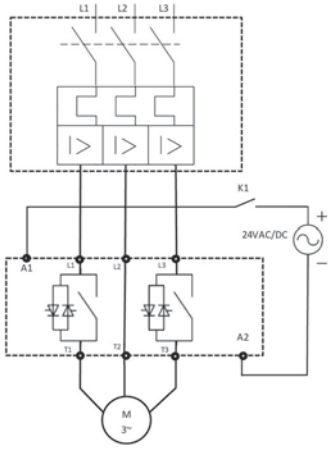
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Wiring diagrams

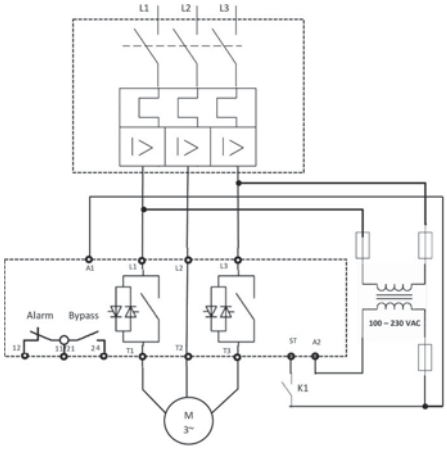
ADXC...400



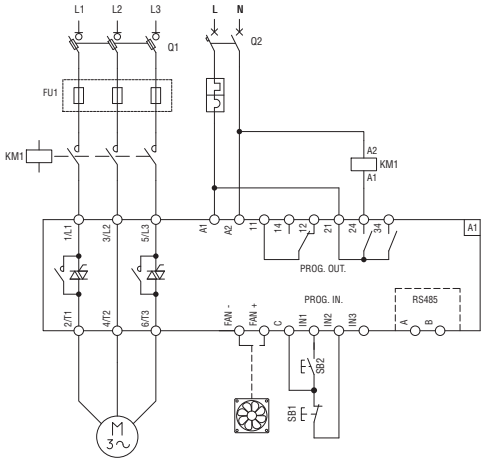
ADXC...24



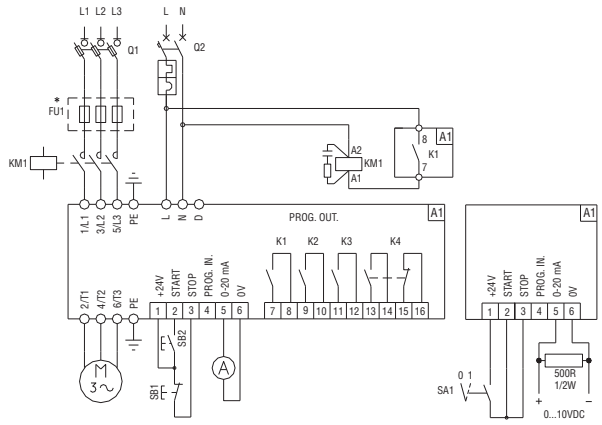
ADXC...600 R2



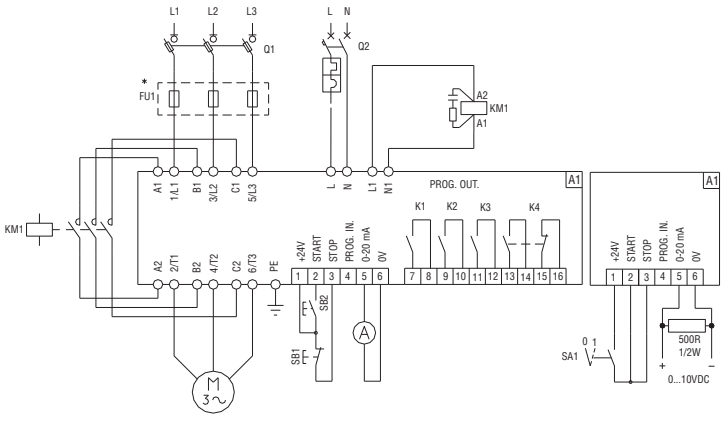
ADXL...600



ADX...B



ADX...



TYPE			ADXC012	ADXC016	ADXC025	ADXC032	ADXC037	ADXC045
			With built-in bypass relay					
Motor	Type		Asynchronous three phase					
	Power	at 220…240VAC	3kW / 3HP	4kW / 5HP	5.5kW / 7.5HP	9kW / 10HP	9kW /10HP	11kW / 15HP
	(40°C)	at 380…415VAC	5.5kW / 5HP	7.5kW / 7.5HP	11kW / 10HP	15kW / 15HP	18.5kW /20HP	22kW / 25HP
		❶ at 440…480VAC	5.5kW 7.5HP	9kW / 10HP	11kW / 15HP	18.5kW / 20HP	22kW / 25HP	22kW / 30HP
		❶ at 550…600VAC	9kW / 10HP	11kW /15HP	20kW / 20HP	22kW / 30HP	30kW / 30HP	37kW / 40HP
Supply voltage	Input voltage Ue (L1-L2-L3)		220…400VAC -15…+10% (ADXC…400…); 220…600VAC -15…+10% (ADXC…600R2)					
	Start command Uc		A1-A2: 24VAC/DC -15...+10% (ADXC…40024); A1-A2: 110…400VAC -15…+10% (ADXC…400); ST: 100…240VAC -15…+10% (ADXC…600R2)					
	Auxiliary power Us		A1-A2: 100…240VAC -15%...+10% for ADXC…600R2 (Self powered for ADXC…400… from L1-L2-L3)					
	Frequency		50/60Hz ±10% self-configurable					
Undervoltage recovery			174VAC (ADXC…)					
Overvoltage recovery			466VAC (ADXC…400…); 700VAC (ADXC…600R2)					
Control input current			0.4…1mA (ADXC…40024); 0.5…5mA (ADXC…400); 0.4…3mA (ADXC…600R2)					
Number of controlled phases			2					
Starting / stopping method			Current limitation					
Number of starts/hour at 40°C			20 (Overload cycle: AC53B: 3-5: 175)			10 (Overload cycle: AC53B: 4-6: 354)		10 (Overload cycle: AC53B: 3.5-5: 355)
Minimum load current			1A	1A	5A	5A	5A	5A
Rated current In (according to IEC test results)		at 40°C IEC	12A	16A	25A	32A	37A	45A
		at 50°C IEC	11A	15A	23A	28A	34A	40A
		at 60°C IEC	10A	13.5A	21A	24A	31A	34A
FLA current (based on UL test results)		at 40°C UL	12A	17A	25A	32A	32A	41A
		at 50°C UL	11A	15A	23A	28A	—	—
		at 60°C UL	10A	14A	21A	24.3A	—	—
Motor protection			Wrong phase sequence					
Cooling system			Natural					
Status indication LEDs			1 red ALARM; 1 yellow RAMP/BYPASS; 1 green SUPPLY					
STARTUP SETTINGS								
Acceleration ramp			1…20 seconds					
Deceleration ramp			0…20 seconds					
Startup voltage			0…85%					
RELAY OUTPUTS (ADXC…600R2 only)								
NC alarm contact (11, 12) / NO bypass contact (21, 24)			3A 250VAC / 3A 30VDC					
INPUT POWER CIRCUIT CONNECTIONS (L1, L2, L3, T1, T2, T3)								
Number and type of terminals			6 fixed M4 screw					
Conductor cross section (min…max)			2.5…10mm² (AWG 2x10…2x14)					
Tightening torque /Tool			2.5Nm (22lbin) / Pozidriv 2					
Cable stripping length			8mm/0.31”					
AUXILIARY SUPPLY CONNECTIONS (A1, A2)								
Number and type of terminals			9 fixed M3 screw					
Conductor cross section (min…max)			0.5…1,5mm² (AWG 10…18)					
Tightening torque / Tool			0.65Nm (5.3lbin) / Pozidriv 0					
Cable stripping length			6mm/0.24”					
AUXILIARY CONNNECTIONS (11, 12, 21, 24, ST, F1, F2)								
Type of terminals			M3 screw					
Conductor cross section (min…max)			0.05…1.5mm² (with cable terminal) (AWG 14…12)					
Tightening torque / Tool			0,45Nm (4lbin) / Pozidriv 0					
Cable stripping length			6mm/0.24”					
INSULATION								
IEC rated insulation voltage Ui			630VAC (ADX…400…); 690VAC (ADXC…600R2)					
AMBIENT CONDITIONS								
Operating temperature			-20°C…+40°C with no derating; >40°C…+60°C with derating (see IEC/UL rated current values given above)					
Storage temperature			-40°C…+80°C					
Relative humidity			<95% non condensing at 40°C					
Maximum pollution degree			2					
Installation category			III					
Maximum altitude			1000m					
HOUSING								
Mounting			Screw fixing on mounting plate or on 35mm DIN rail (IEC/EN 60715)					
IEC degree of protection			IP20					

❶ For ADXC...600R2 types.

TYPE (with 2 controlled phases)		**ADXL...600**
Motor	Type	Asynchronous three phase squirrel cage
	Power	18.5...200kW (500VAC) 25...300HP (550/600VAC)
	Rated current	30...320A
Supply voltage	Power circuit	208...600VAC ±10%
	Auxiliary power Us	100...240VAC±10%
	Frequency	50 or 60Hz ±5% self-configurable
Cooling system	natural	ADXL0030600...ADXL0115600
	forced	ADXL0135600...ADXL0320600 Optional ADXL0030600...ADXL0115600
PROTECTIONS		
Auxiliary supply		Voltage too low
Power supply		Lack of line voltage, lack of phase, out-of-range frequency, minimum and maximum voltage and phase sequence
Motor		Overload at starting (trip class 2, 10A, 10, 15, 20, 25, 30, 35 and 40), overload during running (trip class 2, 10A, 10, 15, 20, 25 and 30), locked rotor, current asymmetry, minimum torque and maximum starting time
Starter		Overcurrent and high temperature
STARTUP AND STOP SETTINGS		
Startup		Torque ramp with current limit, Voltage ramp with current limit, Constant torque with current limit
Stop		Torque ramp, voltage ramp, free-wheel stop
Braking		—
DISPLAY AND PROGRAMMING		
		Using the built-in keyboard and display, PC with CX01 and CX02, App NFC Configurator, App SAM1 with CX02 and remote keyboard with EXC1042
Display		Backlit icon LCD display
Measure view		Maximum current, L1 current, L2 current, L3 current, torque, line voltage, total PF, thermal status motor, starter temperature, active power, motor counter, startup counter
Other views		Operational status, events, alarms, measures
LED		"POWER", "RUN" and "FAULT"
DIGITAL INPUTS		
Number of inputs		3
Input type		2 input with dry contact - 1 input with dry contact or PTC
Input function		OFF, motor startup, motor stop, free-range stop, motor preheating, local control, alarm disabling, thermal status reset, keyboard lock, motor selection, user alarm
RELAY OUTPUTS		
Number of outputs		3
Output arrangement		- 2 NA: 3A 250V~ AC1 - 3A 30V= AC1 - 1 changeover: NO contact 5A 250V~ AC1 - 5A 30V= ; NC contact 3A 250V~ AC1 - 3A 30V=
Output functions		OFF, motor powered, ramp completed, global alarm, limits, remote variable, Axx alarm
COMMUNICATION INTERFACES		
		NFC, front optical port, optional RS485 (EXC1042)
VARIOUS FUNCTIONS		
Clock		—
Operational data memory		Startup counter, motor operation counter and maintenance counter
AMBIENT CONDITIONS		
Operating temperature		-20...+40°C (up tp 60°C with derating)
Storage temperature		-30°...+80°C
Maximum altitude		1000m (higher up with derating)
Maximum pollution degree		3
Operating position		Vertical ±15°
HOUSING		
Mounting		Screw-mount on panel or 35mm DIN rail (IEC/EN 60715) with EXP8003 accessory for ADXL0030 600...ADXL0115 600
IEC degree of protection		IP00

TYPE (with 3 controlled phases)		**ADX...B** (with integrated bypass contactor)	**ADX...** (prearranged for external bypass contactor)
Motor	Type	Asynchronous three phase squirrel cage	
	Power	7.5...132kW (ADX...B)	160...710kW
	Rated current	17...245A (ADX...B)	310...1200A
Supply voltage	Power circuit	208...500VAC ±10% standard (208...600VAC ±10% on demand)	208...415VAC ±10% standard (other voltages up to 690VAC maximum demand)
	Auxiliary power Us	208...240VAC ±10%	208...240VAC ±10%
	Frequency	50 or 60Hz ±5% self-configurable	
Cooling system	Natural	ADX0017...45B	—
	Forced	ADX0060...245B	All types
PROTECTION			
Auxiliary supply		Voltage too low	
Power supply		Phase failure, frequency out of limits, minimum and maximum, voltage and phase sequence, 24VDC static short circuit	
Motor		Overload at starting (trip class 2, 10A, 10, 15, 20, 25, 30, 35, and 40), overload during running (trip class 2, 10A, 10, 15, 20, 25 and 30), locked rotor, current asymmetry, minimum torque and maximum starting time	
Starter		Overcurrent and high temperature	
Analog inputs and outputs		Protection against 24VDC short-circuit	
STARTUP AND STOP SETTINGS			
Startup		Torque ramp with maximum current control	
Stop		Torque control free-range or deceleration	
Braking		DC dynamic with external relay	
DISPLAY AND PROGRAMMING			
		By incorporated or remote keypad or PC	
Display		Backlit LCD 2x16 character	
Selectable languages		Italian, English, French, Spanish	
Measure view		Voltage, current, cos, torque, power (kVA, kW and kvar) and energy consumption	
Other views		Operating status, events, alarms, event log, data	
LED		“POWER”, “RUN” and “FAULT”	
DIGITAL AND ANALOGUE INPUTS			
Number of inputs		4	
Input type		24VDC (no need for external feeder)	
Fixed functions		2 for starting and stopping/reset	
Multifunction input (digital)		Free-wheel stopping, external alarm, motor preheat, on board control, alarm inhibition, thermal protection, manual reset, cascade starting and keypad lock	
Multifunction input (analog)		Motor protection via PTC probes, acceleration and/or deceleration ramp via analog input, analog input thresholds for motor starting and stopping, analog input thresholds for programmable relay enable and disable, PT100 input thresholds for motor starting and stopping and PT100 input thresholds for programmable relay enable and disable	
RELAY OUTPUTS			
Number of outputs		4	
Output arrangement		1 NO+NC: 5A 250V~ AC1 General alarm 3 NO: 5A 250V~ AC1 Programmable	
Output functions		Motor in running mode, started motor, braking, current threshold triggering, maintenance schedule, cascaded startup, PROG-IN thresholds, Axx alarm	
ANALOG OUTPUT			
Format configuration		0...20mA, 4...20mA or 0...10V	
Associated source		Current, torque, motor thermal status and power factor	
COMMUNICATIONS INTERFACE			
RS232		Setup and remote control	
RS485		Used for remote keypad only	
VARIOUS FUNCTIONS			
Clock		Calendar-clock with back-up battery	
Event memory		20 sequential storing of alarms/events with date and hour	
Operational data memory		Energy consumption counter, startup counter, motor operation counter and maintenance counter	
AMBIENT CONDITIONS			
Operating temperature		-10...+45°C (higher up to maximum +45...+55°C, with derating)	
Storage temperature		-30°...+70°C	
Maximum pollution degree		3	
Maximum altitude		1000m (higher up with derating)	
Operating position		Vertical ±15°	
HOUSING			
Mounting		Screw-mount on panel	
IEC degree of protection		IP00❶	

❶ IEC IP20 for ADX0017B...ADX0125B types only.