SOFT STARTERS

ADXN SERIES

THE ADXN SERIES SIMPLE, COMPACT AND FUNCTIONAL

ADXN series soft starters are ideal for applications which demand a **simple, compact and easy to configure solution** for gradually starting and stopping motors. Their **versatility** makes them adaptable to a variety of applications, including pump, fan, conveyor and compressor control, and they are available with **current ratings from 6 to 45 A**.

WIDE RANGE OF POWER SUPPLY

- rated line voltage from 208 to 600 VAC

- available in versions with 24 VAC/DC or 100-240 VAC auxiliary supply voltage

ADXN**B**

INTEGRATED BYPASS

for disabling the thyristors once the starting ramp has concluded
- **energy savings:** reduced heat generation and power loss
- **the thyristors are protected against unpredictable phenomena on the line while the motor is running** (short circuit, overvoltage, etc.).

COMPACT SIZE

45mm wide housing for the entire range. The ideal solution for enclosures with limited space
2 mechanical sizes:
- size 1: 6, 12 and 18A
- size 2: 25, 30, 38 and 45A

25...45A

6...18A

45 mm   45 mm

2 INTEGRATED RELAY OUTPUTS

for signalling or controlling external equipment.

cULus CERTIFIED

all versions are cULus certified for the North America and Canada markets.

ADXN**P**

ADXN**F**

3 STATUS LEDS

for signalling:
- presence of auxiliary power supply
- ramp in progress/Top Of Ramp (TOR)
- alarm.

READY TO USE!

factory set configuration for quick and simple commissioning.

INTEGRATED PROTECTION FUNCTIONS

- soft starter thermal protection with integrated temperature sensor
- line frequency/voltage out of limits
- line voltage not present, phase loss, wrong phase sequence

In addition, for the ADXNP advanced version:
- electronic thermal motor protection, locked rotor, current asymmetry, load too low, starting too long.

Factory set thresholds, can be modify via NFC.

EASY CONFIGURATION

few easy parameters, configurable with the front panel potentiometers or using smart devices with NFC connectivity.

MOTOR PROTECTION

- soft start with gradual ramp up
- reduced inrush current and starting torque
- reduced vibration and mechanical stress
- increased motor service life!

3 VERSIONS

1

BASIC VERSION: ADXN**B**
Quick and simple

Ideal solution for those who need a soft starter with basic functions and extremely simple to configure, with the only purpose to control the gradual starting and stopping of a motor.
Just 3 parameters, configurable with the front potentiometers:
- starting voltage
- acceleration ramp
- deceleration ramp
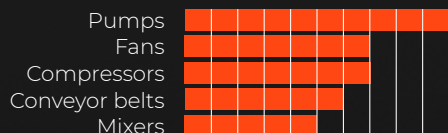
3 potentiometers for basic settings

· Starting voltage: 30-80%U
· Acceleration ramp: 1-20s
· Deceleration ramp: 0-20s

2 relay outputs

OUT1: line contactor control (run)
OUT2: Top Of Ramp (TOR)

Pumps
Fans
Compressors
Conveyor belts
Mixers

2

NFC VERSION: ADXN**F**
Smart and flexible

- NFC connectivity enables device configuration using a smart device with the LOVATO NFC App, available for Android and iOS.
- User-friendly: the app's user-friendly interface makes it easy to identify parameters via its menu structure.
- Accurate, repeatable settings.
- Password protection.
- Factory set to control scroll compressors, as used in air conditioning, chiller and heat pump applications.
- Flexible: all parameters can be modified via NFC to control any application: pumps, fans, conveyors, etc.
- Settings can be saved on the smart device and then copied to other ADXNF without losing time - ideal for programming series of devices.

NFC connectivity for configuration

· initial voltage step
· acceleration ramp
· deceleration ramp
· step down voltage and off deceleration step
· relay output function
· protection threshold
· password
· alarms

2 relay outputs

programmable (line contactor control, Top Of Ramp - TOR, global alarm, specific alarm)

Pumps
Fans
Compressors
Conveyor belts
Mixers

3

ADVANCED VERSION: ADXN**P**
High performance, integrated motor thermal protection, optional RS485

- Parameter configuration with the front potentiometers or NFC connectivity via smart devices with the LOVATO NFC App, available for Android and iOS.
- Integrated electronic motor thermal protection, with configurable separate thermal classes for starting and running.
- Starting ramp control with current limit, with automatic adaptation to the load.

- Password protection.
- Front optical port for the connection of USB and Wi-Fi monitoring and programming devices.
- Optional RS485 (Modbus-RTU) communication module for integration into a control and supervision system.
- Compatible with Xpress configuration software and LOVATO NFC and SAM1 Apps.

NFC connectivity for advanced settings

- rated motor current
- electronic motor thermal protection class
- relay output functions
- protection thresholds
- password
- alarm properties
- RS485 communication settings

3 potentiometers for basic settings

(starting voltag, acceleration ramp, deceleration ramp) can be overridden by NFC
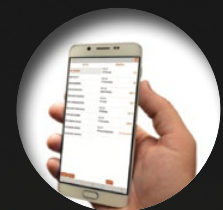
IR optical port

· CX01 USB device
· CX02 Wi-Fi device
· CX04 RS485 module

2 relay outputs

programmable (line contactor control, Top Of Ramp - TOR, global alarm, specific alarm, maximum torque)

| CX01 | CX02 | CX04 |

Pumps
Fans
Compressors
Conveyor belts
Mixers

For motor thermal protection, **ADXNB** and **ADXNF** soft starters can be combined with a SM1R series motor protection circuit breakers thus creating a compact starter with integrated short circuit and overload protection, or alternatively with a set of fuses for short circuit protection and a RF38 series thermal relay for overload protection. Refer to the INSTALLATION section for details.

3 VERSIONS

COMPARISON TABLE

Controlled phases
Integrated bypass
Configurable current limit
Electronic motor thermal protection
No power/phase loss control
Protection against phase inversion
Protection against locked rotor
Soft starter thermal protection (overtemperature)
Protection against low load
Max torque signalling
Configurable alarm properties
Digital start input
Digital relay outputs

Potentiometers for basic settings
NFC connectivity for programming
IR optical port for configuration and monitoring using optional USB (CX01) and Wi-Fi (CX02) devices
RS485 Modbus-RTU module (CX04) for remote control and supervision

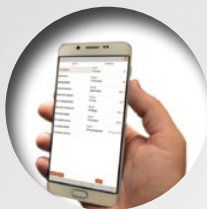| ADXN**B** BASIC VERSION	ADXN**F** NFC VERSION	ADXN**P** ADVANCED VERSION
2	2	2
■	■	■
-	-	■
-	-	■
■	■	■
■	■	■
-	-	■
■	■	■
-	-	■
-	-	■
-	■	■
■	■	■
■ (2, fixed function)	■ (2, programmable)	■ (2, programmable)
■	-	■ (can be overridden via NFC)
-	■	■
-	-	■
-	-	optional

ADVANCED FUNCTIONS

LOVATO NFC

The LOVATO NFC App is available for Android and iOS smart devices, and can be downloaded free of charge from Google Play Store and App Store.

THERMAL RELAY

NOT required on ADXNP version.

■ NFC CONNECTIVITY AND SETTINGS PROTECTION (ADXNF and ADXNP)

ADXNF (NFC) and ADXNP (advanced) soft starters are equipped with NFC (Near Field Communication) connectivity on the front panel, for configuring the soft starter with a smart device (smartphone or tablet) using the LOVATO NFC App.
- User friendly app interface, with parameters divided into groups by function for quick and easy research
- Accurate, repeatable settings, with digital configuration
- Settings can be saved on the smart device and then copied to other soft starters of the same model in a very fast way, ideal for programming series of devices
- The soft starter can be programmed without auxiliary power supply
- Settings can be locked with a password to protect against tampering by unauthorised parties.

■ ELECTRONIC MOTOR THERMAL PROTECTION (ADXNP)

The advanced version ADXNP integrates current transformers to measure the current in the phases powering the motor.
This information enables the soft starter to thermally protect the motor by stopping it when the current exceeds the nominal value for an extended period, depending on the thermal class setting, without the need to install an external thermal relay, thus saving money, space, cabling and installation time.
The electronic thermal protection offers the option of setting two different thermal classes: one for starting and one for operation. Available classes are 10, 15, 20 and 25, depending on how heavy duty the application is.
The nominal motor current, thermal protection classes and the associated alarm properties can all be configured using the LOVATO NFC or LOVATO SAM1 Apps or Xpress software.

LOVATO NFC and SAM1 App downloads

■ FRONT IR OPTICAL PORT (ADXNP)

The advanced version ADXNP is equipped with a front infrared port for USB (CX01) or Wi-Fi (CX02) devices for connecting the soft starter to:
- a PC with Xpress software, via USB or Wi-Fi connection
- an Android or iOS smart device with the LOVATO SAM1 App, via Wi-Fi connection

This enables the user to program the device, run diagnostics and download data quickly and securely, directly on the front panel, and without the need to disconnect the enclosure's power. Using the Xpress software, connected via the CX01 USB device, the user can also monitor the motor's start and stop curves in real time (phase currents, voltages, torque, etc.), which makes commissioning the system far easier. The front IR optical port can also be used for connecting the optional CX04 RS485 communication port.


■ IoT 4.0 READY (ADXNP)

The advanced version ADXNP can be equipped with the optional CX04 RS485 port for integration into a supervision and monitoring network, or to communicate with intelligent devices, like a PLC or HMI.
- 3 wire RS485 serial port
- Modbus-RTU slave protocol
- 24 VAC/DC auxiliary power supply
- Quick and easy screw connection to the soft starter's front optical port.
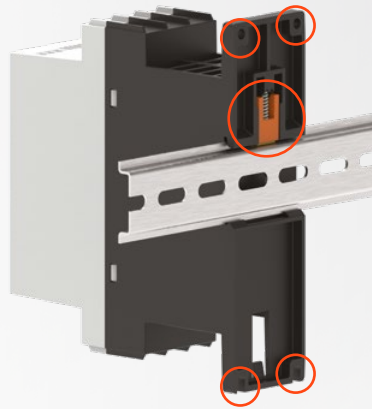

RS485 COMMUNICATION MODULE

The CX04 module can be used to send motor start/stop commands, read measurements and program the soft starter's parameters using the Modbus protocol.
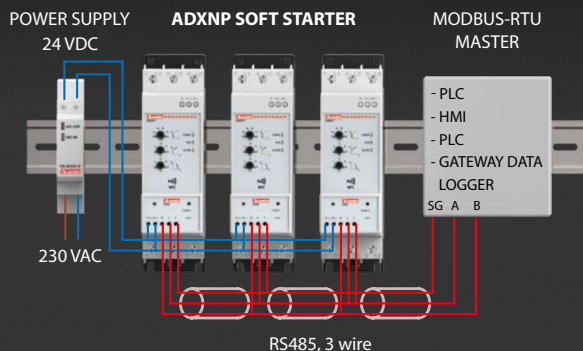
Compatible with the EXCGLA01 gateway data logger, supervision and energy management software **Synergy** and **Synergy** Cloud.

Screw or DIN rail mounting

ADXN soft starters can be fixed with screws or mounted on 35mm DIN rail (IEC/EN/BS 60715).
Screw mounting is done via the 4 holes in the base of the housing, while for the DIN rail mounting there is a rubber insert to prevent the soft starter sliding along the DIN rail.

NUMBER OF STARTS/HOUR

ADXN soft starters offer optimal performance in controlling the majority of applications, and can handle a high number of starts/hour, which can be further increased by adding an optional fan (standard supply on the 38 and 45A models) to satisfy all application requirements. The data refer to the following test conditions: ambient temperature +40°C, starting current 4*In (In = nominal motor current) and 6 second ramp times.

OPTIONAL FAN

ADXN soft starters up to 30A can be equipped with an optional fan (code EXP8007, already integrated into the 38 and 45A models) to improve their heat dissipation and increase the number of starts/hour.

Number of starts/hour WITHOUT FAN

In	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
3A									ADXN006											
6A					ADXN006								ADXN012							
9A			ADXN012					ADXN018												
12A	ADXN012 - ADXN018																			
18A	ADXN018	ADXN025	ADXN030																	
25A	ADXN025	ADXN030																		
30A	ADXN030																			
38A																				
45A																				

Number of starts/hour WITH FAN

In	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
3A									ADXN006											
6A					ADXN006													ADXN012		
9A					ADXN012													ADXN018		
12A				ADXN012											ADXN018			ADXN025		
18A			ADXN018									ADXN025			ADXN030					
25A				ADXN025										ADXN030						
30A			ADXN030								ADXN038		ADXN045							
38A		ADXN038					ADXN045													
45A	ADXN045																			

Coordination with the line contactor

We recommend to install a line contactor upstream the ADXN soft starter, to break the circuit in the event of an anomaly (overload, short circuit, alarms, etc.) and protect the internal thyristors against undesired phenomena which may affect the power supply line when motor starting is not required (e.g. overvoltages or uncontrolled current peaks generated by other devices installed on the same line).

The contactor is controlled by one of the ADXN soft starter's relay outputs, configured with dedicated function CONT.LIN (line contactor), which remains active, from the start command to completion of the deceleration ramp (if enabled).

Line contactor BF...

Soft starter ADXN...

The line contactor must be rated category AC-3 with a current value at least as high as the motor rated current. The following table shows the appropriate line contactors for ADXN soft starters.

Soft starter	Ie [A]	Line contactor
ADXN..006…	6	BF09 (9A AC-3)
ADXN..012…	12	BF12 (12A AC-3)
ADXN..018…	18	BF18 (18A AC-3)
ADXN..025…	25	BF25 (25A AC-3)
ADXN..030…	30	BF32 (32A AC-3)
ADXN..038…	38	BF38 (38A AC-3)
ADXN..045…	45	BF50 (50A AC-3)

Coordination with a motor protection circuit breaker

A motor protection circuit breaker can be installed upstream the ADXN soft starter to protect it against short circuit and overload (for ADXNB and ADXNF versions, which don't integrate motor thermal protection).

The optional rigid connection SM1X3150R is available to simplify cabling, allowing the mounting of the ADXN soft starter (up to 38A) directly to a motor protection circuit breaker type SM1R (rotary control), thus making the starter package more compact and reducing the time required for installation.

Motor protection circuit breaker SM1R...

Rigid connection SM1X3150R

Soft starters ADXN...

The following table lists compatible combinations of soft starters and motor protection circuit breakers.
Note: For the correct selection of the motor protection circuit breaker, check the motor's nameplate current, which must be included in the thermal trip adjustment range of the motor protection circuit breaker.

Soft Starter	Motor protection circuit breaker (MPCB)	MPCB thermal trip adjustment range [A]
ADXN..006…	SM1R0650	4…6.5
ADXN..012…	SM1R1400	9…14
ADXN..018…	SM1R1800	13…18
ADXN..025…	SM1R2500	20…25
ADXN..030…	SM1R3200	24…32
ADXN..038…	SM1R4000	30…40
ADXN..045…	SM2R5000 (*)	34…50

(*) not compatible with the SM1X3150R rigid connector.

Motor overload protection with a thermal relay (ADXNB and ADXNF)

ADXNB and ADXNF soft starters don't integrate the motor thermal protection, and must therefore be protected with an external device.
As an alternative to a motor protection circuit breaker, the motor can be protected against overload with a thermal relay.

The thermal relay is typically installed downstream the line contactor. In case of use of LOVATO Electric RF38 series thermal relay, it can be mounted directly to BF series line contactor without the need of accessory equipment.

Line contactor BF...

Thermal relay RF38...

Soft starter ADXNB... or ADXNF...
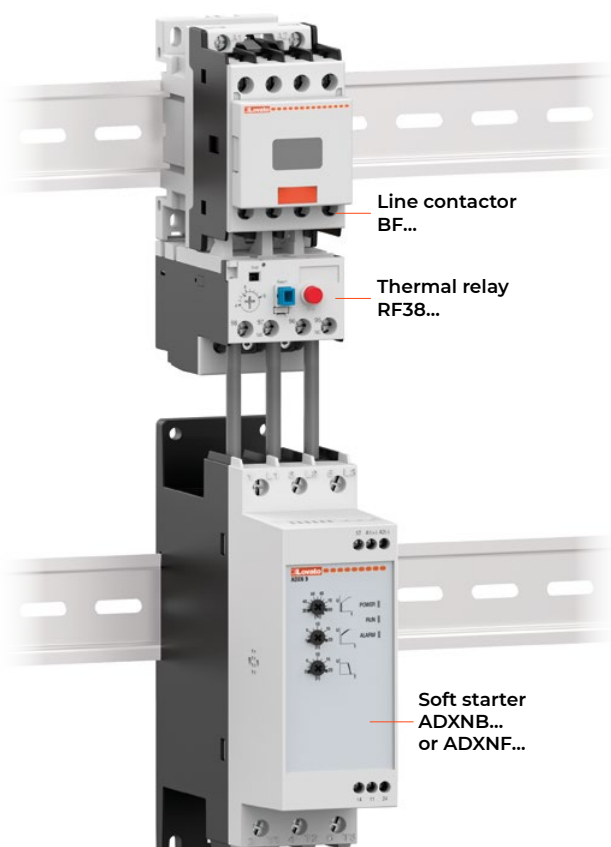
The following table lists compatible combinations of soft starters and RF38 thermal relays.
Note: The selection of the correct thermal relay must be done according to the motor's nameplate rated current (In), which may be lower than the soft starter's rated current (Ie). Make sure the motor's rated current is included in the thermal relay's adjustment range.

| Soft Starter	Ie [A]	Thermal relay	Adjustment range [A]
ADXN..006…	6	RF380650	4…6.5
ADXN..012…	12	RF381400	9…14
ADXN..018…	18	RF381800	13…18
ADXN..025…	25	RF382500	20…25
ADXN..030…	30	RF383200	24…32
ADXN..038…	38	RF383800	32…38
ADXN..045…	45	RF825000	35…50

TECHNICAL DATA

Wiring diagrams

Switch disconnector + fuses + contactor, control by switch (0-1)
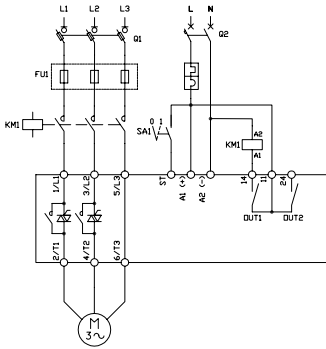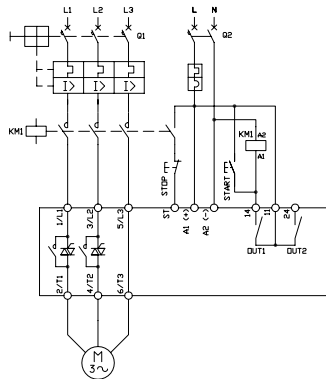

Switch disconnector + fuses + contactor + thermal relay, control by switch (0-1)
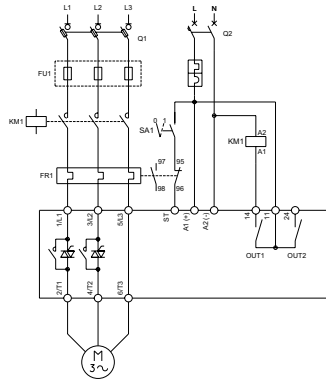
Motor protection circuit breaker + contactor, control by switch (0-1)
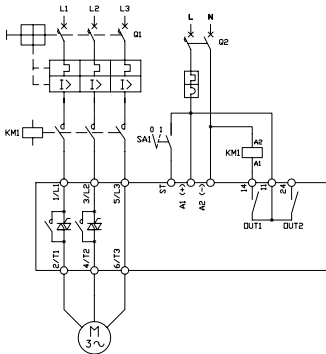
Motor protection circuit breaker + contactor, control by pushbuttons


Power ratings

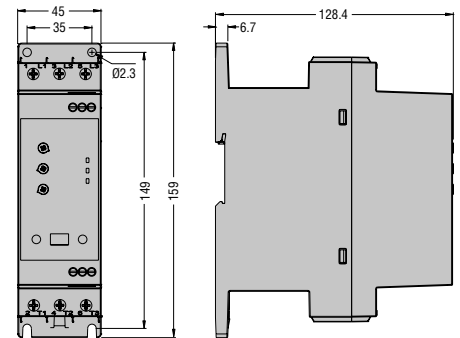| Code	Rated operational current Ie [A]	IEC rated operational power [kW]			FLA [A]	UL rated operational power [HP]				
		230 VAC	400 VAC	500 VAC		208 VAC	220-240 VAC	380-415 VAC	440-480 VAC	550-600 VAC
ADXN..006…	6	1.1	2.2	3	6.1	1	1.5	2	3	5
ADXN..012…	12	3	5.5	5.5	11	3	3	5	7.5	10
ADXN..018…	18	4	7.5	11	18	5	5	10	10	15
ADXN..025…	25	5.5	11	15	24.2	7.5	7.5	10	15	20
ADXN..030…	30	7.5	15	18.5	28	7.5	10	15	20	25
ADXN..038…	38	11	18.5	22	34	10	10	20	25	30
ADXN..045…	45	11	22	30	44	10	15	25	30	40

General characteristics

- soft starter with two controlled phases
- built-in bypass relay
- rated starter current Ie: 6...45 A
- rated line voltage Ue: 208...600 VAC ±10%
- rated frequency: 50/60Hz ±5%, self-configuring
- auxiliary power supply Us: 24 VAC/DC -15%/+10% (ADXN...24), 100...240 VAC -15%/+10% (ADXN...)
- operating temperature: -20...+60°C (derating above 40°C)
- storage temperature: -30...+80°C

- pollution degree 2
- overvoltage category III
- screw or 35mm DIN rail mounting (IEC/EN/BS 60715)
- protection rating: IP20
- cULus, EAC, RCM certified
- compliant with IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-2, UL 60947-4-2, CSA C22.2 n° 60947-4-2.
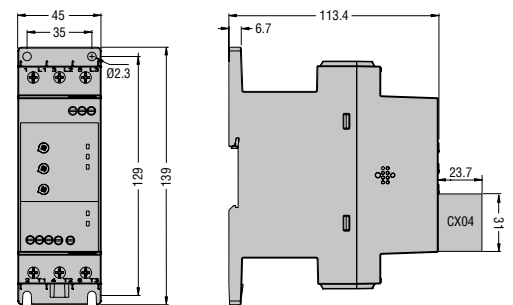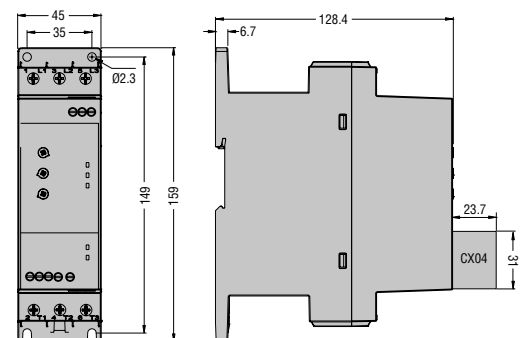
Dimensions [mm]

ADXN...006... - ADXN...018...
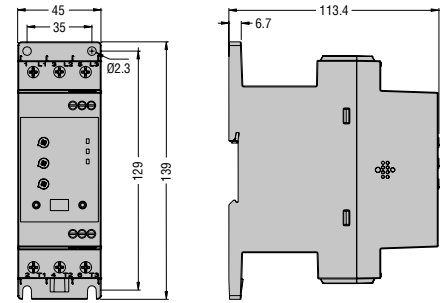
ADXN...025... - ADXN...045...

ADXNP006... - ADXNP018...
with CX04 RS485 communication module.

ADXNP025... - ADXNP045...
with CX04 RS485 communication module.

ORDER CODES

Soft Starter

ADXN**B**

ADXN**F**

ADXN**P**

Rated operational current Ie [A]	BASIC		NFC		ADVANCED	
	Auxiliary power supply Us		Auxiliary power supply Us		Auxiliary power supply Us	
	100-240VAC	24VAC/DC	100-240VAC	24VAC/DC	100-240VAC	24VAC/DC
6	ADXNB006	ADXNB00624	ADXNF006	ADXNF00624	ADXNP006	ADXNP00624
12	ADXNB012	ADXNB01224	ADXNF012	ADXNF01224	ADXNP012	ADXNP01224
18	ADXNB018	ADXNB01824	ADXNF018	ADXNF01824	ADXNP018	ADXNP01824
25	ADXNB025	ADXNB02524	ADXNF025	ADXNF02524	ADXNP025	ADXNP02524
30	ADXNB030	ADXNB03024	ADXNF030	ADXNF03024	ADXNP030	ADXNP03024
38	ADXNB038	ADXNB03824	ADXNF038	ADXNF03824	ADXNP038	ADXNP03824
45	ADXNB045	ADXNB04524	ADXNF045	ADXNF04524	ADXNP045	ADXNP04524

Accessories

SM1X3150R

EXP8007

CX01

CX02

CX04

Order code	Description
ADXN… series accessories	
SM1X3150R	Rigid connection for ADXN soft starters (up to 38A) for direct mounting to SM1R type motor protection circuit breakers
EXP8007	Fan for ADXN soft starters (6 to 30A) for increasing the number of starts/hour (Note: ADXN sizes 38 and 45A are equipped with the fan as standard supply)

Order code	Description
Communication devices for ADXNP… version	
CX01	PC/ADXNP communication device with optical USB connector for programming, data download, diagnostics and firmware update
CX02	Wi-Fi device for connecting PCs/smartphones to the ADXNP, for programming, data downloads and diagnostics
CX04	RS485 communication module for ADXNP, Modbus-RTU protocol. 24 VAC/DC auxiliary power supply

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www.LovatoElectric.com

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LOVATO ELECTRIC S.P. A.

via Don E. Mazza, 12
24020 Gorle (Bergamo), ITALY

tel +39 035 4282111
info@LovatoElectric.com

PD176 GB 02 22