Safety Notes

⚠ DANGER

BRANCH-CIRCUIT PROTECTION & SAFETY OVERLOAD PROTECTION

1. This product does not contain any branch-circuit protection or internal safety overload protection. The installer must add branch-circuit protection upstream of the unit, and provide external or remote safety overload protection to the end installation. Such branch-circuit and safety overload protection must comply with applicable local regulations. UL: The above mentioned branch-circuit protection is necessary for compliance with National Electric Code (NEC) requirements.
2. The cables used to connect the EPack's auxiliary supply and voltage reference must be correctly protected by branch-circuit protection. It is the responsibility of the installer to add branch-circuit protection. Such branch-circuit protection must comply with applicable local regulations.

HAZARD OF ELECTRICAL SHOCK, EXPLOSION OR ARC FLASH

3. Eurotherm shall not be held responsible for any damage, injury, losses or expenses caused by inappropriate use of the product (EPack), or failure to comply with these instructions.
4. If the product is used in a manner not specified by the manufacturer, the protection provided by the product might be impaired.
5. Disassembling the product is strictly forbidden.
6. The product must be installed and maintained by suitably qualified personnel, authorized to work in an industrial low voltage environment.
7. The product is not suitable for isolation applications, within the meaning of EN60947-1.
8. EPack alarms protect thyristors and loads against abnormal operation, and provide the user with valuable information regarding the type of fault. Under no circumstances must these alarms be regarded as a replacement for proper personnel protection. It is strongly recommended that the installing authority include independent, system-safety mechanisms to protect both personnel and equipment against injury or damage, and that such safety mechanisms be regularly inspected and maintained. Consult the EPack supplier for advice.
9. The product is designed to be installed in a cabinet connected to the protective earth ground according to IEC60364-1 and IEC60364-5-54 or applicable national standards.
10. Electrically conductive pollution must be excluded from the cabinet in which the product is mounted. To ensure a suitable atmosphere in conditions of conductive pollution, fit adequate air conditioning/filtering/cooling equipment to the air intake of the cabinet, e.g. fitting fan-cooled cabinets with a fan failure detection device or a thermal safety cut-out.
11. Before carrying out any wiring to the product, it must be ensured that all relevant power and control cables, leads or harnesses are isolated from voltage sources.

⚠ DANGER

HAZARD OF ELECTRICAL SHOCK, EXPLOSION OR ARC FLASH

12. Before any other connection is made, the protective earth ground terminal shall be connected to a protective conductor. Wire conductor cross sections must comply with table 9 of IEC60947-1 or NEC Article 310 Table 310-16. U.L.: The earth connection must be made using a UL-listed ring type crimp. The cables used must be rated 90℃ stranded copper only.
13. The protective earth ground connections and power terminals must be tightened according to the torque values defined in Table 1. Appropriate regular inspections must be performed.
14. Any interruption of the protective earth ground conductor inside or outside the product, or disconnection of the protective earth ground terminal is likely to make the product dangerous under some conditions. Intentional interruption is prohibited. Whenever it is likely that protection has been impaired, the unit shall be made inoperative, and secured against accidental operation. The manufacturers nearest service centre must be contacted for advice.
15. Power connections: wire conductor cross sections must comply with table 9 of IEC60947-1 or NEC Article 310 Table 310-16. The cables used must be rated 90℃ stranded copper only.
16. The 85Vac to 550Vac auxiliary supply shall be protected by a supplemental fuse or a dual protection fuse as defined in EPack Controller User Guide HA032713.
17. The EPack's rated short-circuit conditional current is 100kA for co-ordination type 2. Nevertheless, if opening of either the branch circuit protective or the supplemental (high speed) fuses occurs, the product shall be examined by suitably qualified personnel and replaced if damaged.
18. The maximum voltage between any pole of the power supply and terminals 1/L1, 3/L2, 5/L3 and Vref shall be lower than 550Vac. The maximum voltage between any pole of the power supply and earth ground shall be lower than 550Vac (rated insulation voltage 500V).
19. Connection of two conductors in the same terminal is not permitted.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

1. Signal and power voltage wiring must be kept separate from one another. Where this is impractical, shielded cables should be used for the signal wiring.
2. Do not use the Vref terminal to replicate voltage signals (in a 'daisy chain'), as the PCB track between the two poles is not designed to withstand short-circuit.
3. The product shall have one of the following as a disconnecting device, fitted within easy reach of the operator, and labelled as the disconnecting device:
   a. A switch or circuit breaker which complies with the requirements of IEC60947-1 and IEC60947-3.
   b. A separable coupler which can be disconnected without the use of a tool.

⚠ WARNING

4. The product is designed to be mounted vertically. There must be no obstructions (above or below) which could reduce or hamper airflow. If more than one instance of the product is located in the same cabinet, they must be mounted in such a way that air from one unit is not drawn into another.
5. To reach the thermal performance the gap between two EPacks must be at minimum 10mm.
6. Under some circumstances, the EPack heatsink temperature may rise above 50℃ and it can take up to 15 minutes to cool after the product is shut down. Give consideration to additional warnings and barriers to prevent injury.
7. This product has been designed for environment A (Industrial). Use of this product in environment B (domestic, commercial and light industrial) may cause unwanted electromagnetic disturbances in which cases the installer may be required to take adequate mitigation measures.
8. The 24V auxiliary supply must be derived from a SELV or PELV circuit†.
9. To ensure that EPack complies with Electromagnetic Compatibility requirements, ensure that the panel or DIN rail to which it is attached is correctly grounded. The ground connection, designed to ensure ground continuity, is not in any way a substitute for the protective earth ground connection.
10. **IP20:** In order to maintain IP20 protection, the stripped length of the power cables from the supply and to the load must be adapted according to the insulation thickness.
11. If the upper and/or lower access door is open and if voltage reference connector is removed, IP20 is compromised and the product is IP10.
12. Breakaway features have been designed into the product especially to improve the IP20 rating. These features should be removed only for cable cross sections of 50mm^2 or more.

Failure to follow these instructions can result in death, serious injury or equipment damage.

†*SELV is defined (in IEC60947-1) as an electrical circuit in which the voltage cannot exceed 'ELV' under normal conditions or under single fault conditions, including earth ground faults in other circuits. The definition of ELV is complex as it depends on environment, signal frequency, etc. See IEC 61140 for further details.*

The I/O connector (5-way) & auxiliary supply (24V ac/dc) (2-way) are compliant to the SELV requirements. The alarm relay output is compliant to the SELV requirements; it can be connected to SELV or to voltage up to 230V (Rated insulation voltage U_i: 230V)

EPack™

Power Controller

This sheet applies to units providing control of three phases, for current ratings of 16A to 125A. It summarises important information.

⚠ *Do not attempt to install or operate the unit without reference to the EPack Controller User Guide HA032713.*

Eurotherm by Schneider Electric

DVD Contents and Installation

This DVD contains Eurotherm Product Tools utility and configuration software, and includes a copy of the EPack Controller User Guide HA032713 in Adobe® PDF format. The DVD installer menu should autorun on Microsoft® Windows® computers.

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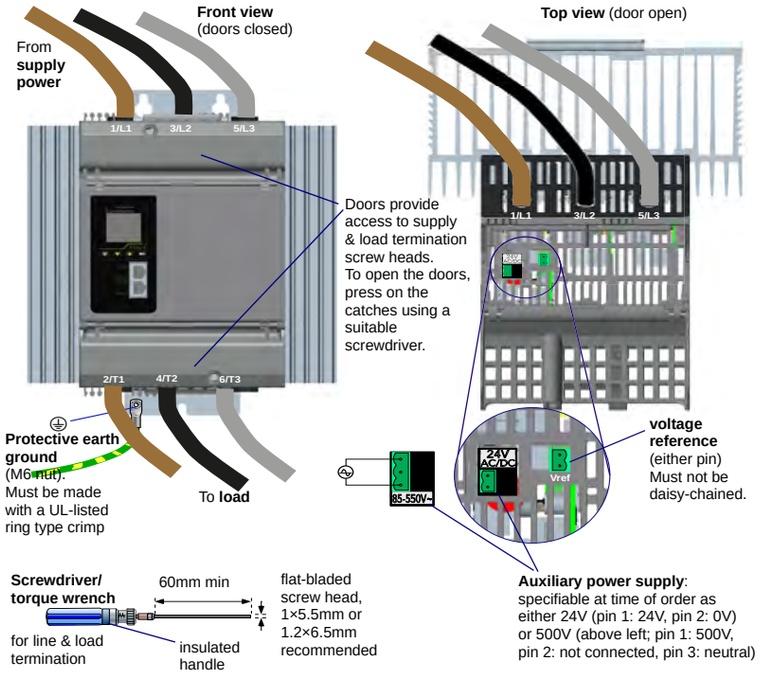
HA032906ENG Issue 1, January 2017

Electrical Installation

⚠ Connections are summarised below for quick reference—Do not attempt electrical installation without referring to the EPack Controller User Guide HA032713 for full details.

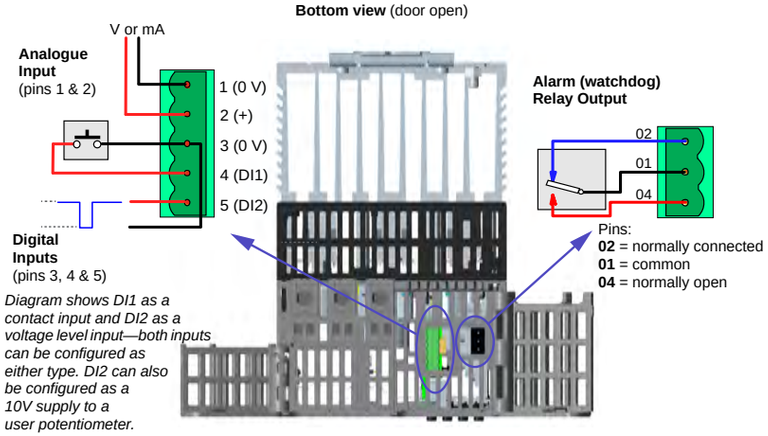
Supply and Load Wiring

A 125A EPack is shown below. Units for other current ratings are of similar appearance and are wired in the same manner. This diagram does not show the necessary external fuses that are required for branch circuit & safety overload protection.



I/O Wiring

A 63A EPack is shown below. Units for other current ratings are of similar appearance and are wired in the same manner. Use a 0.6 × 3.5 mm screwdriver for pluggable connectors.



Analogue Input	Digital Inputs		Relay Output
Use the **Adjust > Ana_in type** menu to configure the input range as 0 to 10V, 1 to 5V, 2 to 10V, 0 to 5V, 0 to 20mA or 4 to 20mA. Selecting a mA range automatically places a suitable shunt resistor in the circuit, there is no need for the user to fit external components.	Absolute maxima for externally applied signals: ±30V or ±25mA **Contact input** ranges: open: 800Ω to ∞ undefined: 450Ω to 800Ω closed: 0Ω to 450Ω Source current 10mA min, 15mA max.	**Voltage level input** ranges: high: +11V to +30V (with current greater than 6mA) low: −3V to +5V (with current 2mA to 30mA), or +5V to +11V (with current of 2mA) **User potentiometer** supply (DI2 only): 10.2V±2%,10mA; pot. range: 2kΩ to 10kΩ ±20%	switching characteristics (resistive loads): V_{max} = 264V RMS V_{min} = 5V dc, I_{max} = 2A RMS, I_{min} = 10mA.

Supply Cable Sizes and Torques

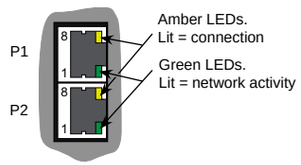
Terminals	Terminal Capacity	Wire Type	Torque
1/L1, **3/L2** and **5/L3** (supply voltage) and **2/T1**, **4/T2** and **6/T3** (load supply)	For 80A to 125A EPacks: 10 mm^2 to 50 mm^2 (AWG 8 to AWG 2/0) For 16A to 63A EPacks: 1.5 mm^2 to 25 mm^2 (AWG 16 to AWG 4)	Stranded copper rated 90℃	For 80A to 125A EPacks: 5.6 N·m (50 lb·in) For 16A to 63A EPacks: 2.0 N·m (18 lb·in)
⏚ (protective earth ground)	M6 ring-type crimp terminal. A UL-listed ring-type crimp terminal must be used.	Stranded copper rated 90℃	5.6 N·m (50 lb·in)
The following pluggable connectors are 5.08mm in pitch: **Vref** (2-way, voltage reference) **24V AC/DC** (2-way, low voltage auxiliary supply) or **85V–550V~** (3-way, high voltage auxiliary supply) **1 2 3 4 5** (5-way, I/O connector) **02 01 04** (3-way, alarm relay output)	0.25 mm^2 to 2.5 mm^2 (AWG 24 to AWG 12)	Stranded copper rated 75℃	0.56 N·m (5 lb·in)

Table 1 Supply Cable Sizes and Torques

Communications Wiring

Two Ethernet (10/100 base-T autosensing) ports **P1** and **P2** are located on the front face of the unit.
Both ports accept RJ45 connectors with pin-outs as below:

Pin	Signal
1	Tx+
2	Tx−
3	Rx+
4	Not used
5	Not used
6	Rx−
7	Not used
8	Not used



Specification

Standards

EN60947-4-3:2014 (Low-voltage switchgear and control gear Part 4-3: Contactors and motor-starters - AC semiconductor controllers and contactors for non-motor loads (identical to IEC60947-4-3:2014).

UL60947-4-1 CAN/CSA C22.2 NO.60947-4-1-14 Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-Starters - Electromechanical Contactors and Motor-Starters.

Russian Approvals: EAC approval and Pattern pending.

Installation Categories

	Installation Category	Rated impulse withstand voltage (U_{imp})	Rated Insulation Voltage
Communication	II	0.5kV	50V
Standard I/O	II	0.5kV	50V
Relays	III	4kV	230V
Module Power	III	6kV	500V

Table 2 Installation categories for EPack

Physical

Dimensions and mounting centres: See Mechanical Installation section for details

Weight:
- 16 to 32A units 3060g + user connectors
- 40 to 63A units 3510g + user connectors
- 80 to 100A units 5830g + user connectors
- 125A units 7940g + user connectors

EMC

EMC immunity tests: EN60947-4-3:2014
EMC emission tests: EN60947-4-3:2014
This product has been designed for environment A (Industrial). Use of this product in environment B (domestic, commercial and light industrial) may cause unwanted electromagnetic disturbances in which case the user may need to take adequate mitigation measures

Power (at 45℃)

Voltage range
- Load: 100 to 500V (+10% −15%)
- Auxiliary: 24V ac/dc (+20% −20%) or 100 to 500V (+10% −15%)

Frequency range: 47 to 63 Hz for load and ac auxiliary supplies)

Power requirement:
- 24V dc supply: 12W
- 24V ac supply: 18VA
- 500V ac supply: 20VA

Installation category: See Table 2

Nominal load current: 16A to 125A

Short circuit protection: by external supplemental fuses (high speed fuse) see User Manual HA032713.

Rated short-circuit conditional current: 100kA (co-ordination type 2)

Pollution degree: Pollution degree 2

Utilization categories (Load types): AC51: Non-inductive or slightly inductive loads, resistance furnaces
AC56a: Transformer primary or MoSi (molybdenum silicide)
Time temperature dependant loads (silicon carbide, carbon)

Duty cycle: Uninterrupted duty / continuous operation

Load types: Three phase control of resistive loads (low/high temperature coefficient and non-ageing/ageing types) and transformer primaries.

Overload conditions: AC51: 1×I_e continuous (where I_e is the rated operational current, as per IEC 60947-4-3: 2014)

Operator Interface

Display: 1.44″ square TFT colour display allowing viewing of selected parameter values in real time, plus configuration of instrument parameters for users with adequate access permission.

Push buttons: Four push buttons provide page and item entry and scroll facilities.

Environment

Temperature limits:
- Operating: 0℃ to 45℃ at 1000m
  0℃ to 40℃ at 2000m
- Storage: −25℃ to +70℃

Altitude: 1000m maximum at 45℃
2000m maximum at 40℃

Humidity limits: 5% to 95% RH (non-condensing)

Protection:
- CE: IP20 (EN60529)
- UL Open Type

Atmosphere: Non-explosive, non-corrosive, non-conductive

External wiring:
- General: Must comply with IEC60364-1 and IEC60364-5-54 and all applicable local regulations. Cross sections must comply with table 9 of IEC60947-1.
- UL: Must comply with NEC and all applicable local regulations. Cross sections must comply with NEC, Article 310 Table 310-16.

Temperature rating: Power conductors: 90℃; other wires: 75℃

Shock: To (EN60068-2-27) and IEC60947-1 Annex Q

Vibration (EN60068-2-6): To (EN60068-2-6) and IEC60947-1 Annex Q

Symbols used in the instrument labelling

One or more of the symbols below may appear as part of the instrument labelling

⏚	Protective conductor terminal	⚡	Risk of electric shock
~	AC supply only		Precautions against static electrical discharge must be taken when handling this unit.
c UL us LISTED 74B5 E86160	Underwriters Laboratories listed mark for Canada and USA.	⚠	Refer to the manual for instructions.
	Do not touch heatsink hot surface.	CE	Declaration of conformity to European standard.

China RoHS

The data shown here is related to the China RoHS 2.0 Administrative Measures for the Restriction of Hazardous Substances in Electric Appliances and Electronic Products released January 21st 2016.

部件名称 Part Name	有害物质 - Hazardous Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 Metal parts	O	O	O	O	O	O
塑料部件 Plastic parts	O	O	O	O	O	O
电子件 Electronic	X	O	O	O	O	O
触点 Contacts	O	O	O	O	O	O
线缆和线缆附件 Cables & cabling accessories	O	O	O	O	O	O

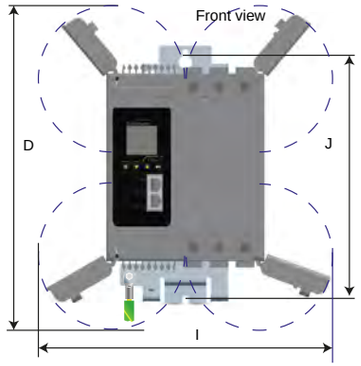
本表格依据SJ/T11364的规定编制。
O: 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
X: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。

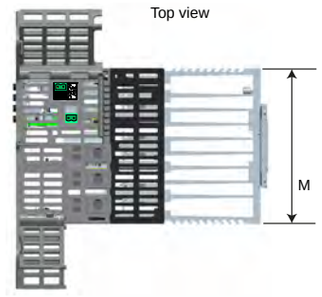
This table is made according to SJ/T 11364.
O: indicates that the concentration of hazardous substance in all of the homogeneous materials for this part is below the limit as stipulated in GB/T 26572.
X: indicates that concentration of hazardous substance in at least one of the homogeneous materials used for this part is above the limit as stipulated in GB/T 26572

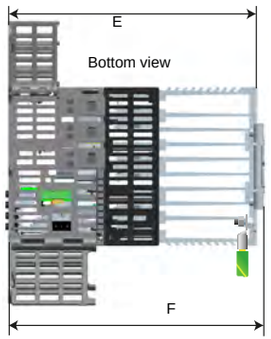
Signed (Kevin Shaw, R&D Director): KShaw Date: 3rd January 2017

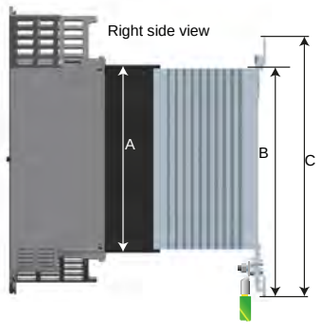
Mechanical Installation

⚠ Product dimensions are summarised below for quick reference—Do not attempt mechanical installation without referring to the EPack Controller User Guide HA032713 for full details
The diagram below shows a 63A EPack (doors open), other low current units are similar— refer to Table 3 for dimensions.

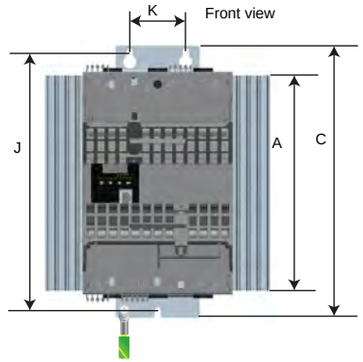


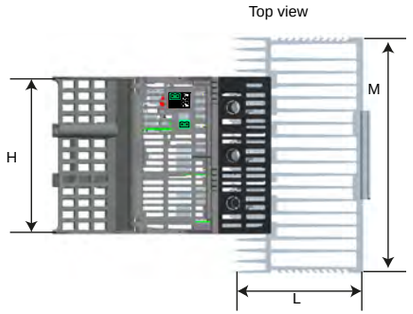


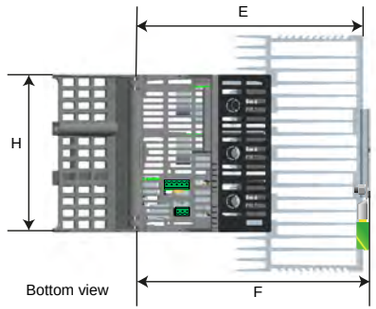




The diagram below shows a 125A EPack (doors open), 80 and 100A units are similar— refer to Table 3 for dimensions.







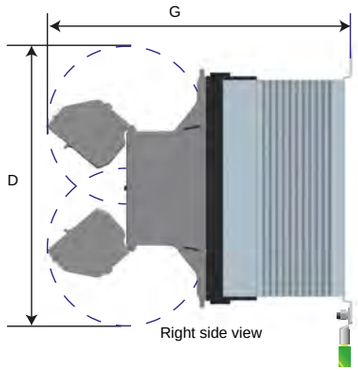


Table 3 Dimensions for EPacks of different current ratings (all values in millimetres)

Label	Dimension	16–32A	40–63A	80–100A	125A
A	**Height**	166	166	230	230
B	with DIN Rail	213.5	213.5	not applicable	not applicable
C	with wallmount backplate	229.5	229.5	291	291
D	with doors open	290	290	310	310
E	**Depth**	185	220	235	235
F	with backplate	192	227	242	242
G	with doors open†	not applicable	not applicable	325	325
H	**Width**	117	117	160	240
I	with doors open†	242	242	not applicable	not applicable
J	**Wall-mounting** (top to bottom)	219	219	277	277
K	**Wall-mounting** (across top bracket)	not applicable	not applicable	60	60
L	**Heatsink** depth	not applicable	not applicable	not applicable	130
M	**Heatsink** width	117	117	160	240

† for low current EPacks (16A to 63A) doors open to the side, increasing the effective width of the unit. For high current EPacks (80A to 125A) doors open towards the front, increasing the effective depth of the unit. In both cases, opening the doors requires additional clearance above and below the unit.

Mounting

⚠ The EPack must be mounted inside a suitable fan-cooled cabinet as stipulated in the EPack Controller User Guide HA032713.

Within the cabinet, the following mounting options are possible (refer to HA032713 for detailed instructions):

- Low current units (16A to 63A) may be mounted on two horizontal, parallel 7.5mm or 15mm DIN rails, or wall-mounted on a bulkhead by fitting the supplied upper mounting bracket (which features a single mounting hole)
- High current units (80A, 100A and 125A) must be wall-mounted on a bulkhead. The upper mounting bracket features two mounting holes (see entry K in Table 3).