

# CR-TEC Engineering

Automated Valve Solutions



## VT+

Electric Actuators

Installation and Operation Manual



400Nm  
2400Nm

Facteur de marche  
50%  
Duty cycle

Indice de protection  
IP68  
Enclosure protection

Anticondensation  
intégrée  
Anticondensation  
Heater

Battery  
Backup  
BBPR

Positionnement  
POSI  
Positioning

3  
POSITIONS

BLUETOOTH®

Powered by  
AXMART®

## Index

<b>General information</b> .....	<b>2</b>
• Description	
• Transport and storage	
• Maintenance	
• Safety instructions	
<b>Dimensions</b> .....	<b>3</b>
<b>Electric wiring</b> .....	<b>5</b>
• Warnings	
• Multipin connector	
• Electronic boards	
• Operating modes	
• Wiring: modulating 3-point • On-off • Pulse control	
• Positioning function	
• AXMART® Bluetooth® function	
<b>BBPR emergency battery system (option)</b> .....	<b>13</b>
<b>Codification</b> .....	<b>14</b>
<b>Technical data</b> .....	<b>15</b>

This product meets the European Directive 2012/19/UE about electrical and electronic equipment (DEEE). It mustn't be mixed with common waste. Please, recycle or dispose of them according to your country laws.



## INTRODUCTION

This manual has been made to guide you through the installation and use of our VT+ electric actuators. Please, read it carefully before using our products and be sure to keep it.

## DESCRIPTION

These electric actuators have been designed to perform the control of a valve with 90° rotation. We cannot be held responsible for any other use. You can however consult us for any other application.

## ATTENTION OWNERS AND USERS

Thank you for purchasing the device. This equipment will provide safe and productive operation as long as it is used in accordance with the instructions in this Manual and is properly maintained. Importantly, unless the user is adequately trained and supervised, there is a possibility of death, serious personal injury, property damage or damage to the equipment.

Owners and users of this equipment bear the responsibility to make certain that this equipment is used properly and safely. READ THIS MANUAL carefully, learn how to use and service this equipment correctly, and strictly follow all of the instructions contained in this Manual and the requirements of local law. Failure to do so could result in death, serious personal injury, property damage or damage to the equipment. This Manual should be considered a permanent part of your machine and should be kept available for easy reference by any user.

Owners should not permit anyone to touch this equipment unless they are over 18 years of age, are adequately trained and supervised, and have read and understand this Manual. Owners should also ensure that no unauthorized personnel come in contact with this equipment.

If this equipment, or any of its parts, becomes damaged or needs repair, stop using the equipment and contact an experienced service individual immediately. If the warning labels or this Manual are misplaced, damaged or illegible, or if you require additional copies, please contact us for these items at no charge.

Please remember that this Manual and the warning labels do not replace the need to be alert, to properly train and supervise users, and to use common sense when using this equipment.

If you are ever uncertain about a particular task or the proper method of operating this equipment, don't hesitate to contact us.

## TRANSPORT AND STORAGE

- The forwarding agents being held as responsible for damages and delays of the delivered goods, the consignees are obliged to express if applicable their reserves, prior to accept the goods. The goods delivered directly ex works are subject to the same conditions.
- The transport to the place of destination is carried out by using rigid packing material.
- The products must be stored in clean, dry, and ventilated places, preferably on appropriate palettes or shelves. Actuators should not be stored upside down.

## MAINTENANCE

- Maintenance is ensured by our factory. If the supplied product does not work, please check the wiring according to the electric diagram as well as the power supply of the electric actuator in question.
- For any question, please contact our after-sales service.
- To clean the outside of the actuator, use a lint and soapy water. DO NOT USE ANY CLEANING PRODUCT WITH SOLVENT OR ALCOHOL.

## SAFETY INSTRUCTIONS



(To be read prior to the installation of the product)

- The electric power supply must be switched-off before any intervention on the electric actuator (i.e. prior demounting its cover or manipulating the manual override knob).
- Any intervention must only be carried out by a qualified electrician or persons instructed in accordance with the regulations of electric engineering, safety, and all other applicable directives.
- Strictly observe the wiring and operation instructions as described in the manual: otherwise, the proper working of the actuator can not be guaranteed anymore. Verify that the indications given on the identification label of the actuator fully correspond to the characteristics of the electric supply.
- Any other use than that described by the manufacturer jeopardizes the protection provided by this apparatus.

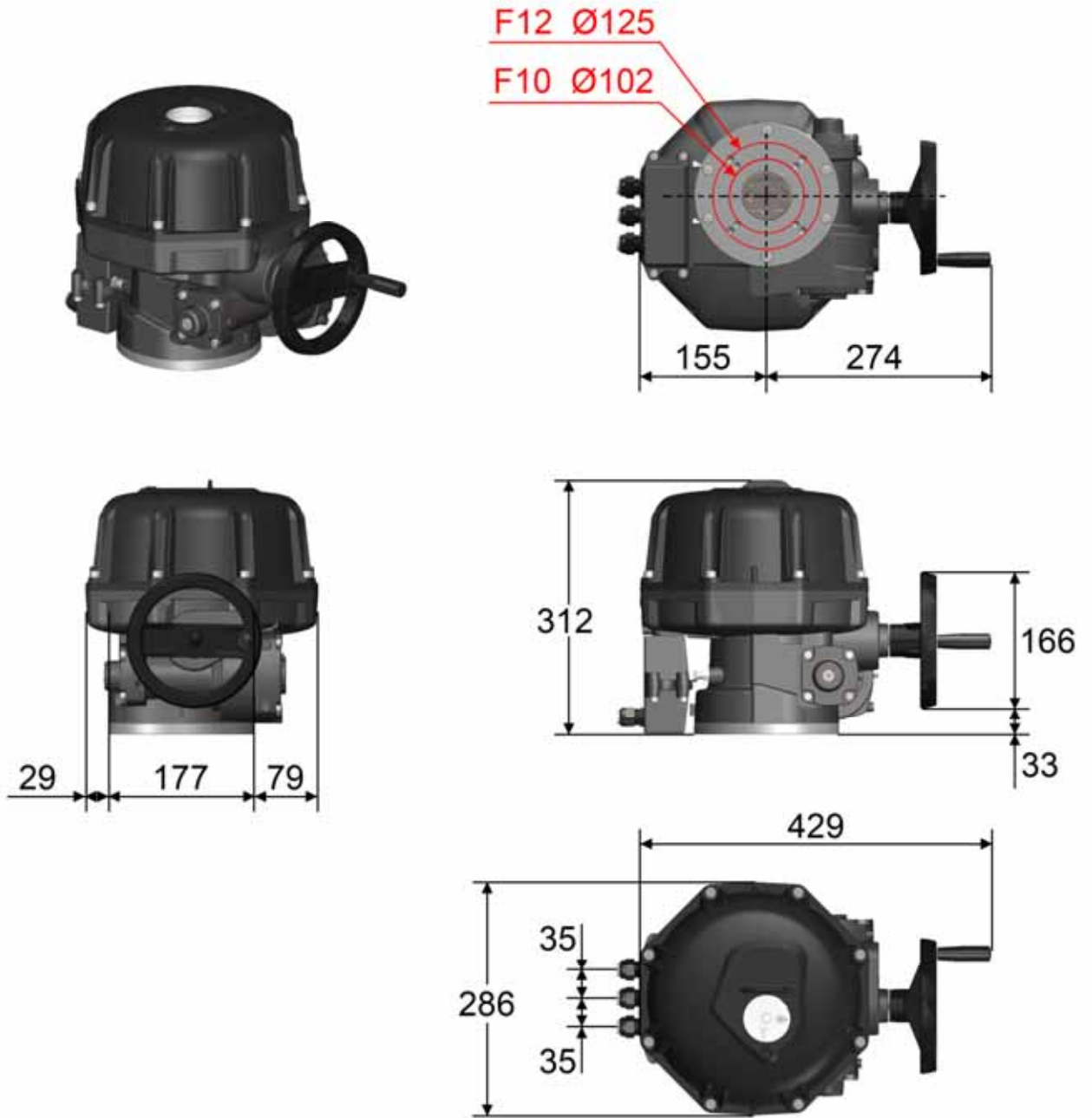
## MOUNTING INSTRUCTIONS



(To be read prior to the installation of the product)

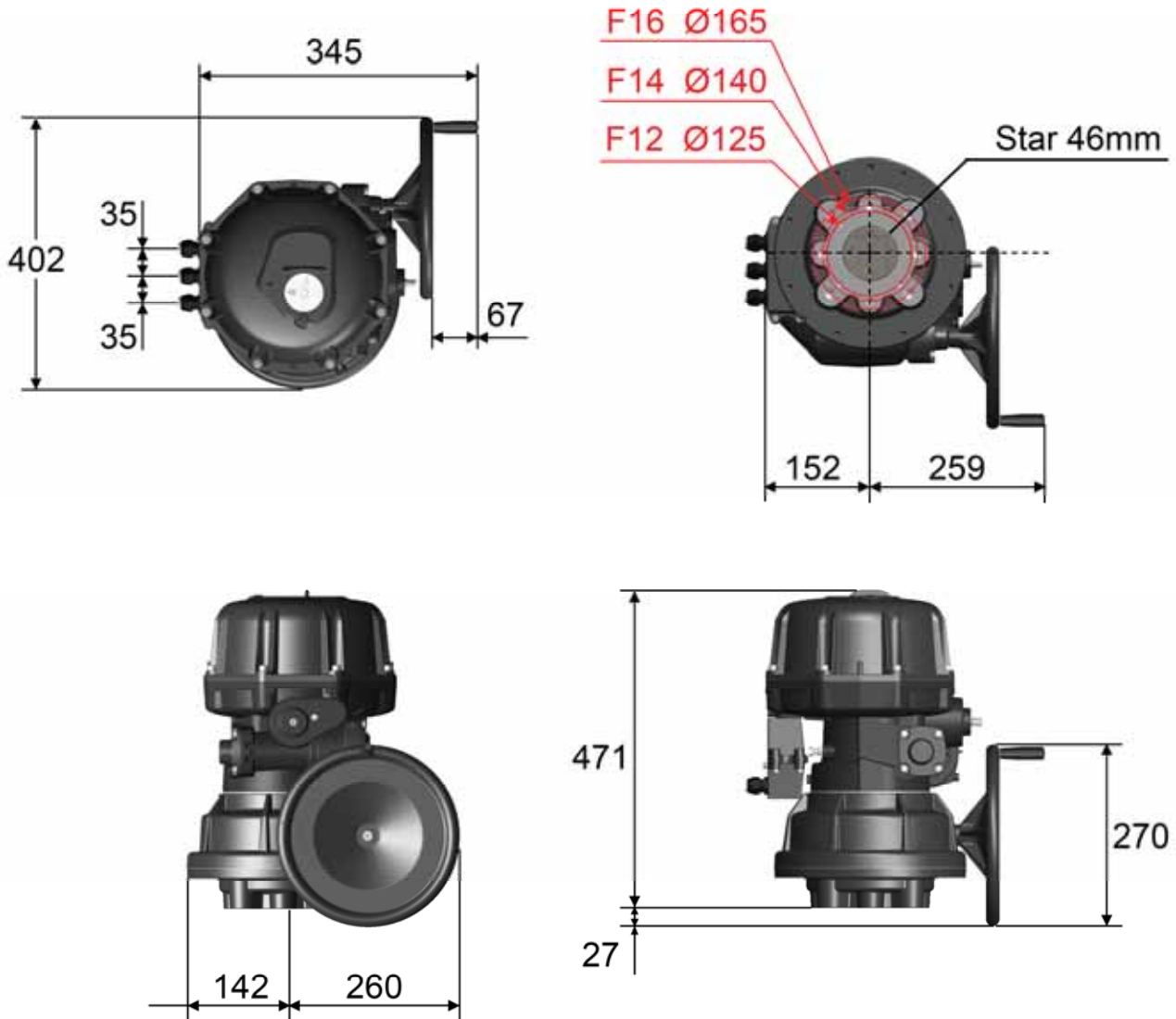
- Do not mount the actuator less than 30 cm from an electromagnetic disturbance source.
- Do not position the equipment so that it is difficult to operate the disconnecting device.
- Respect all safety rules during fitting, dismantling and porting of this apparatus.

Dimensions : 400, 600 and 1000Nm models



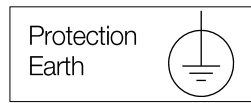
Star (mm)	Depth (mm)	ISO 5211 connection	Diameter (mm)	M threaded	Depth (mm)	Screw number
36	41	F10	102	M10	25	4
		F12	125	M12	30	4

Dimensions : 1500 and 2400Nm models



Star (mm)	Depth (mm)	ISO 5211 connection	Diameter (mm)	M threaded	Depth (mm)	Screw number
46	50	F12	125	M12	20	4
		F14	140	M16	25	4
		F16	165	M20	30	4

## Electric wiring: warnings



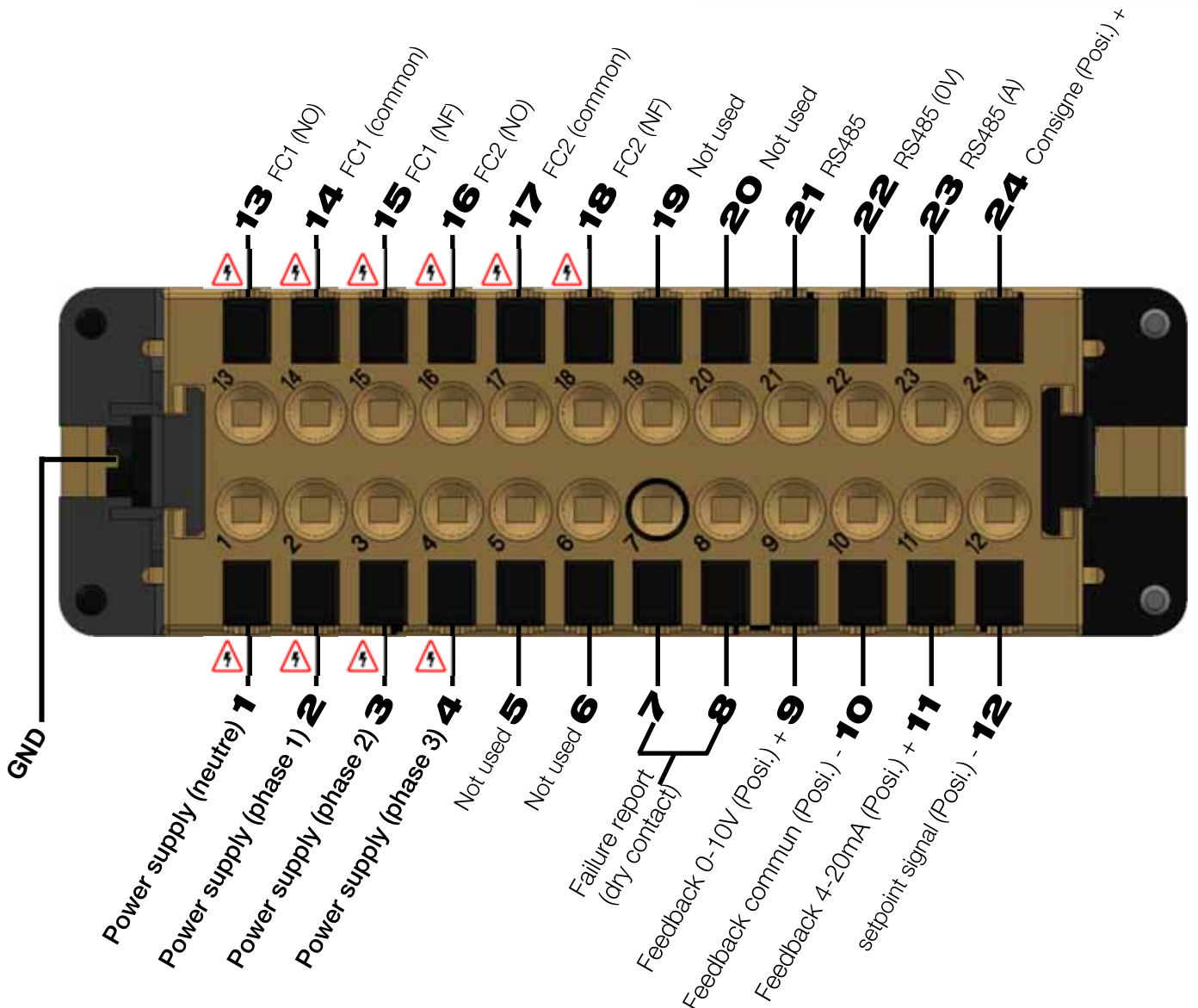
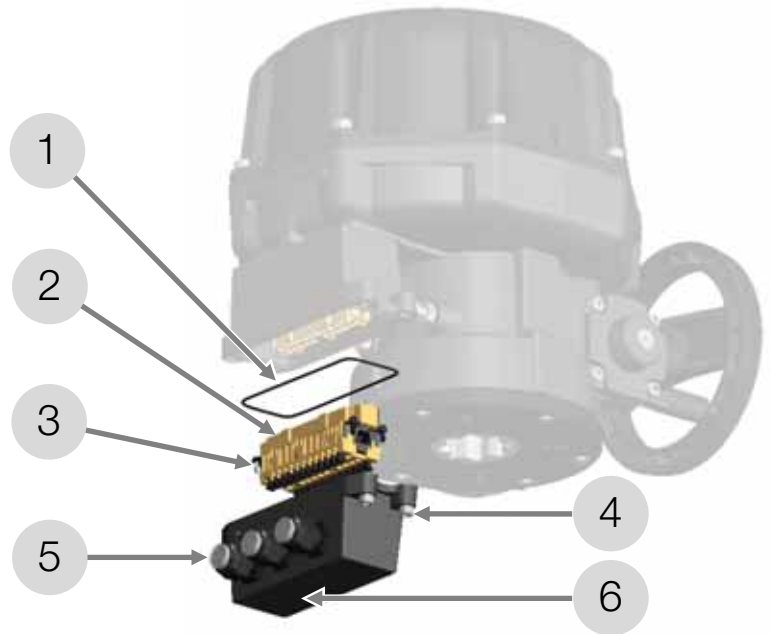
- As stipulated in the applicable regulation, the connection to earth contact is compulsory for devices with working voltages exceeding 42V.
- The actuator is being always under power, it must be connected to a disconnection system (switch, circuit breaker) to ensure the actuator's power cut. The latter must be closed to the actuator, easy to reach and marked as being the disconnecting device for the equipment.
- The temperature of the terminal can reach 90°C.
- In case of long cables, please note the induction current shall not exceed 1mA.
- To optimize the installation security, please connect the failure feedback signal (terminals 7 & 8).
- The actuator can tolerate temporary overvoltage of the electrical grid up to  $\pm 10\%$  of its nominal system operating voltage.
- It is necessary to connect all actuators to an electrical cabinet. The power supply cables must have the RATED diameter for the maximum current supported by the actuator and comply with IEC 60227 or IEC 60245 standards.
- The selection of the cables and cable glands: the maximal operating temperature of the cables and cable-glands must be at least 110°C.
- In order to ensure the IP68 tightness, the cable gland for feedback wiring must be used (7 to 12mm cable). Otherwise, the cable gland must be replaced by a ISO M20 IP68 cap. A cable gland is tight when it has been tighten by one turn ahead of contact between rubber seal and nut.
- The auxiliary limit switches must be connected with rigid wires. If the applied voltage is higher than 42V, the user must foresee a fuse in the power supply line.
- The feedback switches must be powered with the same voltage. The reinforced insulation of the motor control allows voltages up to 250V AC.
- Connection to feedback microswitches:
  - 4 to 24 V DC and 12 to 250 V AC
  - minimum current 100 mA
  - maximum current 5 A (resistive), 0.5 A (motor), 0.125 A (capacitive loads)

## Multipin connector

1	Seal
2	Removable connector
3	4 x M3x10 screws
4	4 x CHC M6x30 Stainless steel A2 screws
5	3 x ISO M20 x 1,5 cable glands
6	Connector cover

To wire the actuator, unscrew the 4 CHC M6x30 screws, and the 4 M3x10 screws. The wiring can be realized without tool, just raising the strips in front of each pin.

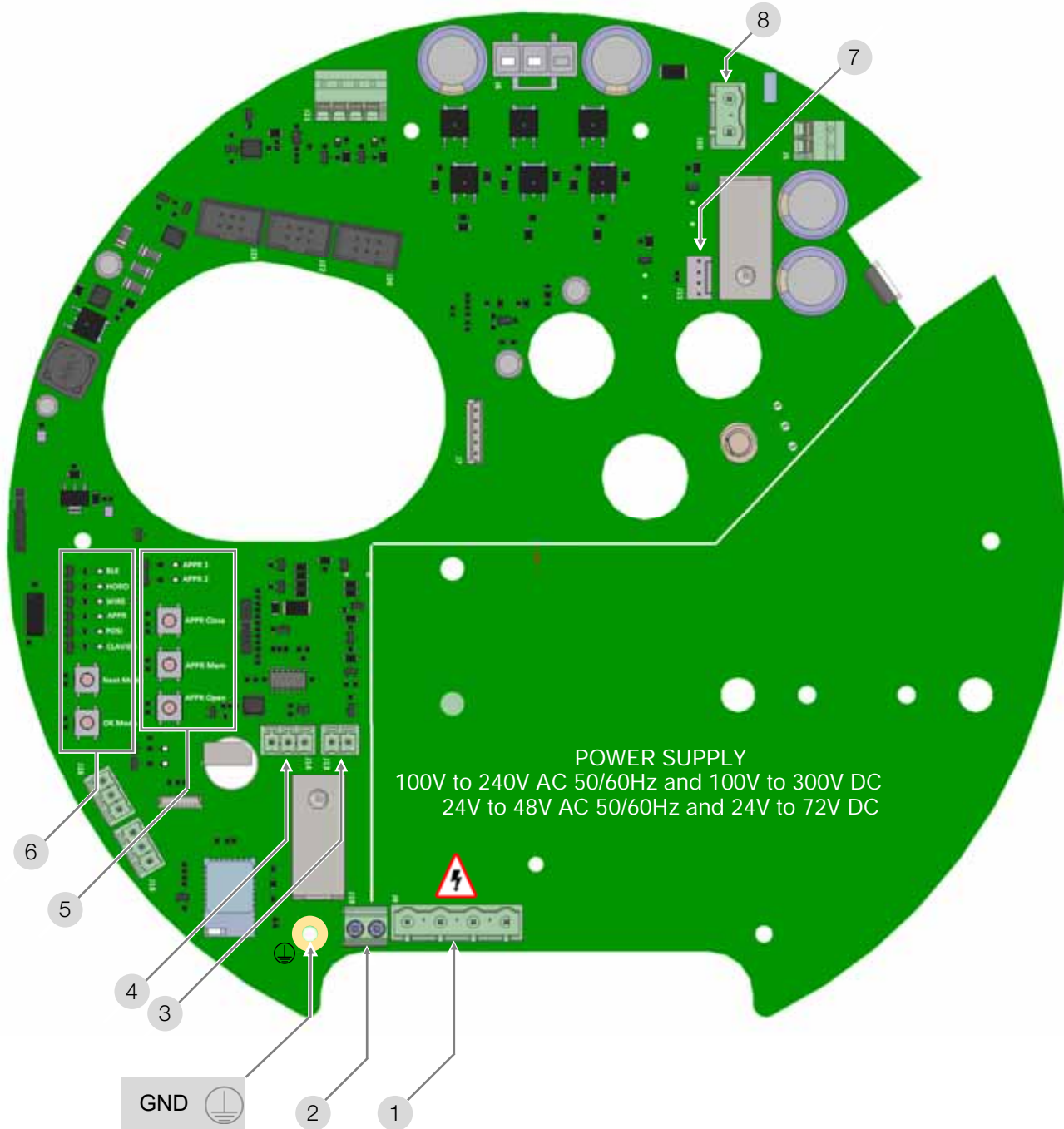
For the reassembly, make sure that the seal is correctly positioned in its groove to ensure tightness.



- The earth ( **GND** ) and the pins **1, 2, 3, 4** must be wired through the same cable.
- Possible presence of 250V 50/60Hz (or 300V DC) on these pins. The other ones are powered with safety extra low voltage (SELV).

## Electronic card

High voltage card (SNBA050000) : 100V to 240V AC 50/60Hz and 100V to 300V DC  
 Low voltage card (SNBA051000) : 24V to 48V AC 50/60Hz and 24V to 72V DC



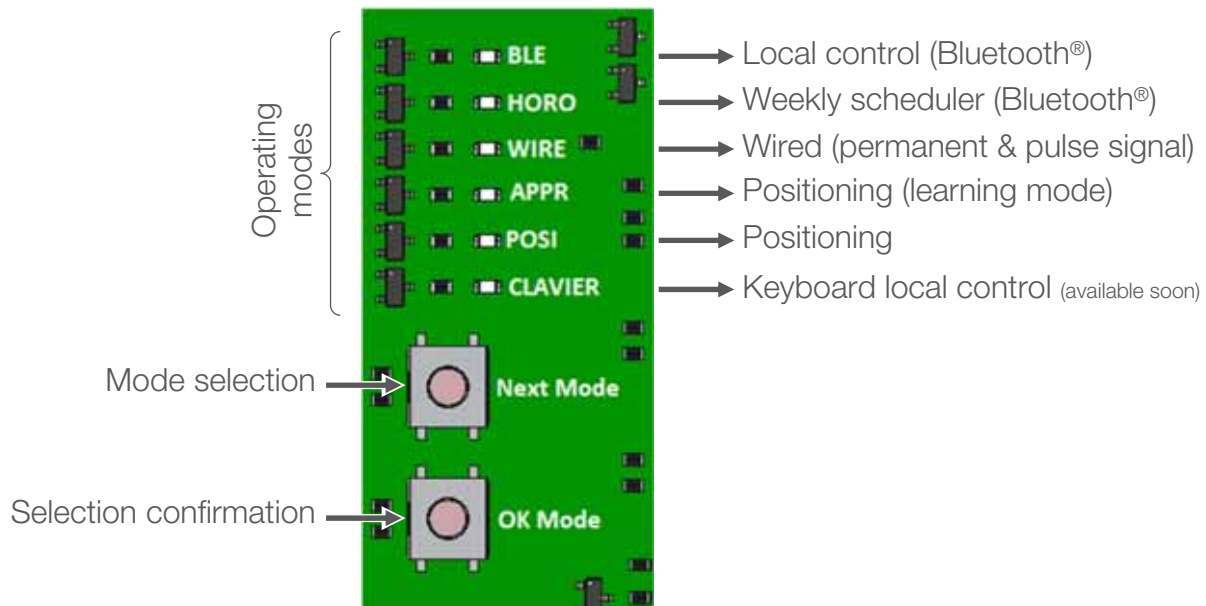
- |                                      |  |
|--------------------------------------|--|
| 1 Power supply terminal              | 5 Learning mode panel (positioning mode) |
| 2 Failure report (24V 3A max.)       | 6 Functioning mode selection panel       |
| 3 Setpoint signal (positioning mode) | 7 BBPR board connector                   |
| 4 Feedback signal (positioning mode) | 8 BBPR board connector                   |

**FUSES** SNBA050000 : 3 x T 5A, 250V Littlefuse  
 SNBA051000 : 3 x 20A, 72V DC Shurter

**GND** Protection earth



## Functioning modes

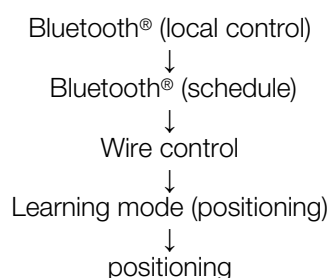


## Description

- **Wireless local control (Bluetooth®)** : allows the use of the actuator from 20m maximum (in open field). This mode requires a smartphone or a tablet with the **AXMART®** software.
- **Weekly scheduler (Bluetooth®)** : thanks to AXMART®, you can assign up to 20 repeatable tasks to each actuator. This mode requires a smartphone or a tablet with the **AXMART®** software.
- **Wire control**: electric control - permanent (on-off or 3-modulating point) or pulse.
- **Positioning** (learning mode) : this mode is needed for storing limit positions of the actuator.
- **Positioning** : allows the control of the actuator with a 0-10V or 4-20mA setpoint signal.

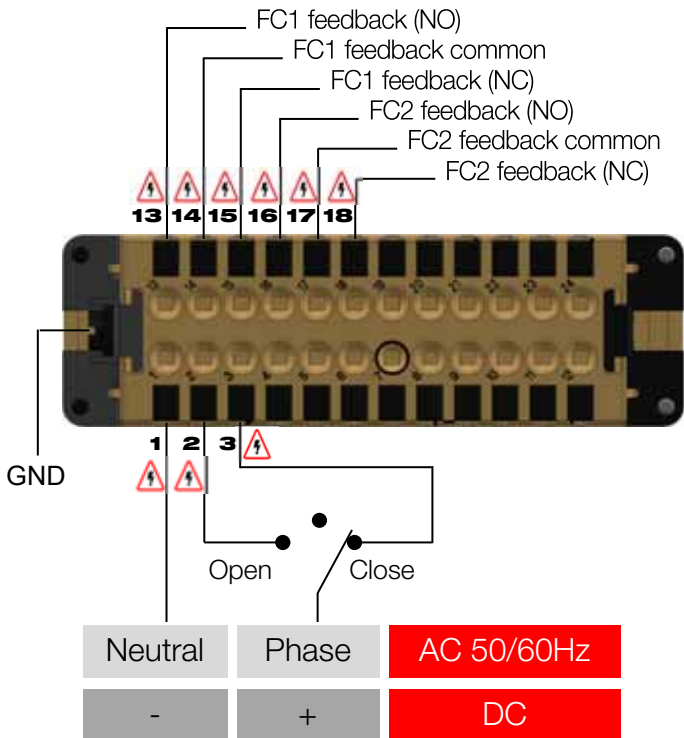
## Functioning mode selection

The « Next Mode » button scrolls the functioning modes in the following order:

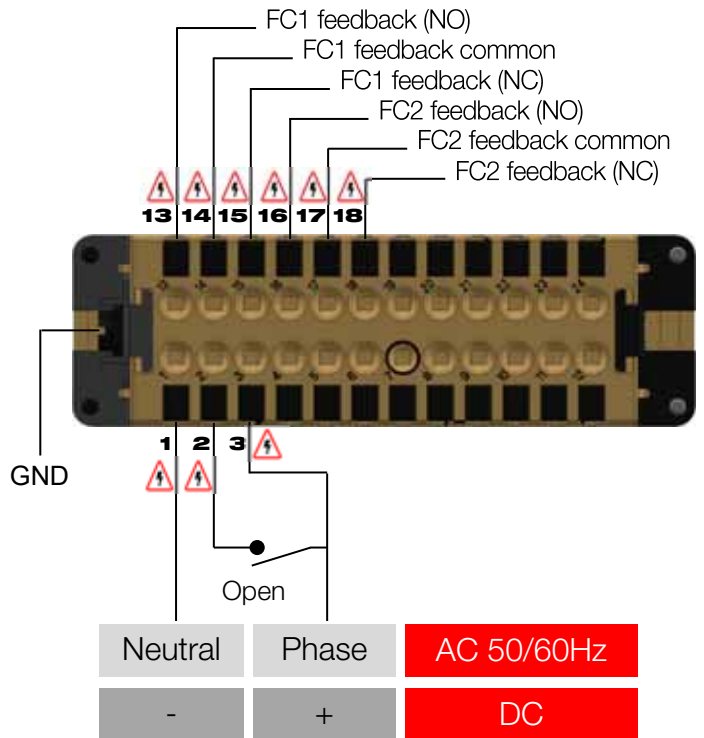


When the mode is selected, press « OK Mode » to confirm.

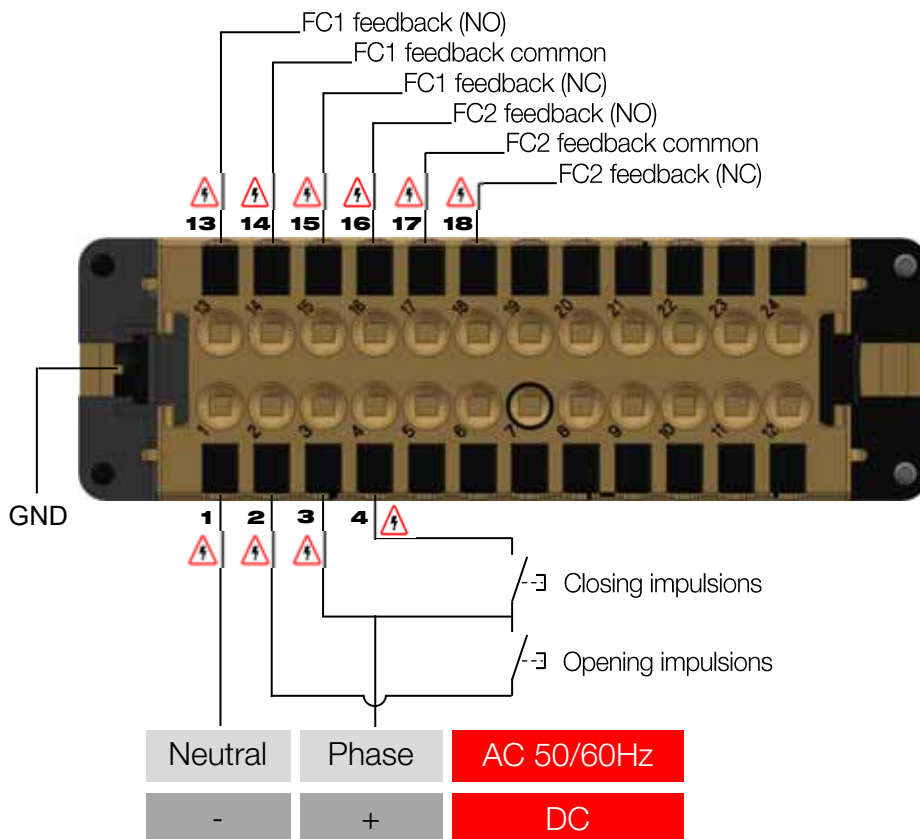
**Permanent wiring**  
3-Position Switch Control



**Permanent wiring**  
ON/OFF Switch Control



**Wiring • VT+ models with pulse control**

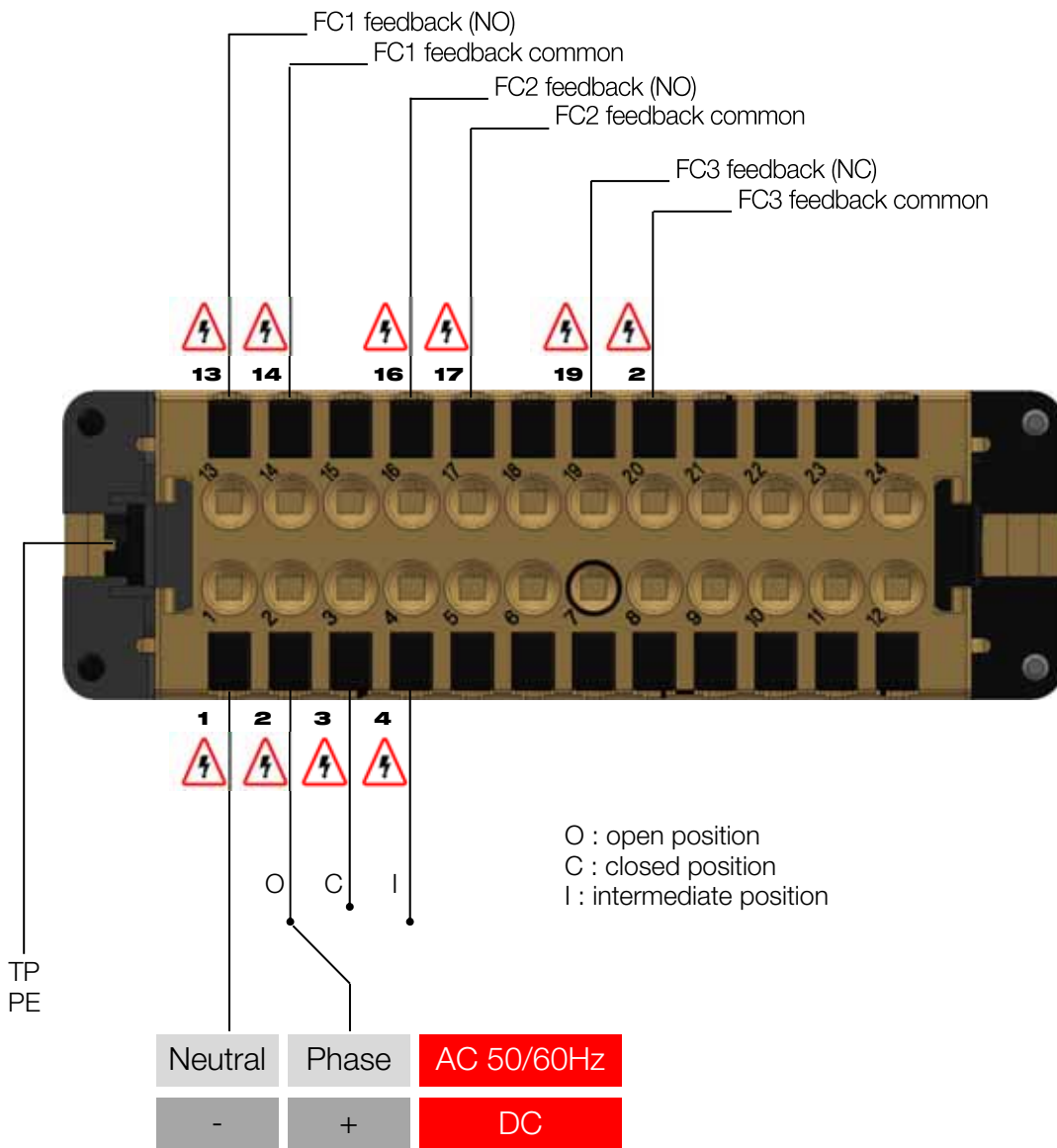


**i** A feedback signal ( 4-20mA or 0-10V) is available from terminal 9 10-11 whichever your selected control mode is. See wiring diagram page 23.

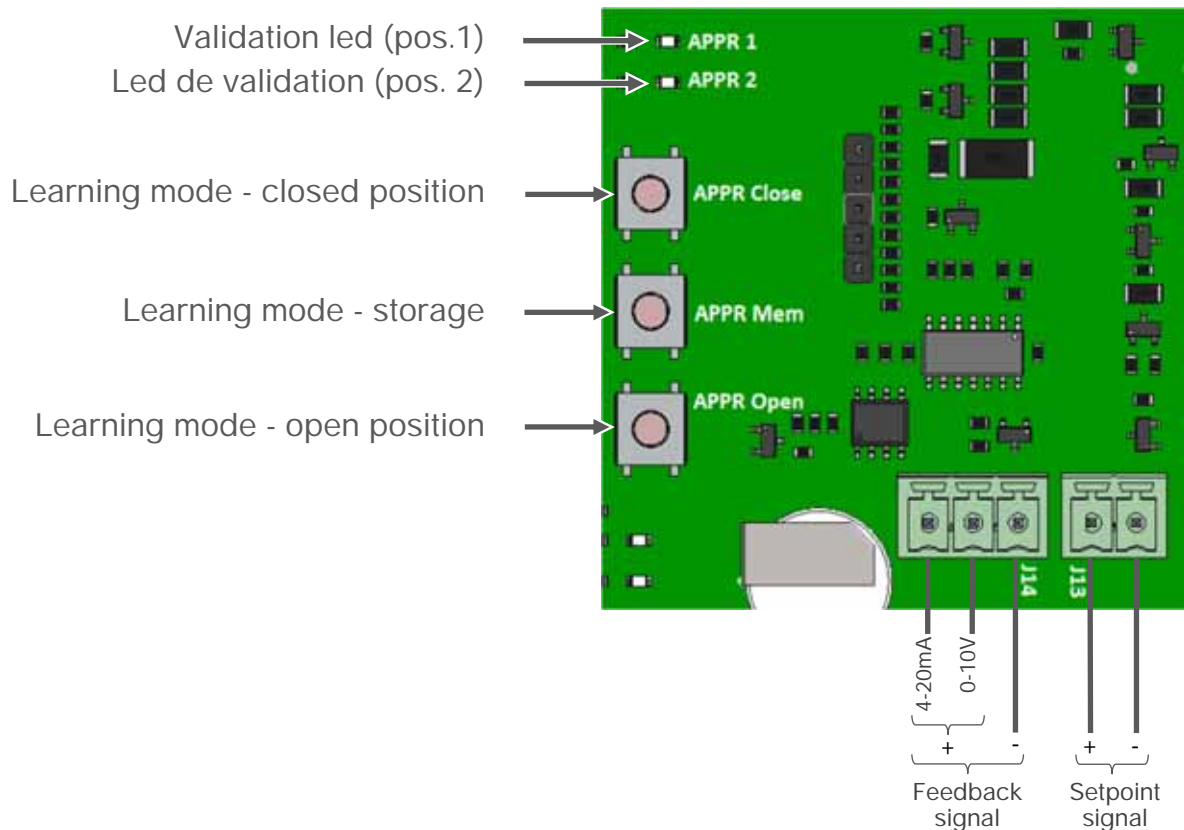
**!** At least **500ms** Between two impulses

- The earth ( GND ) and the pins 1, 2, 3, 4 must be wired through the same cable.
- Possible presence of 250V 50/60Hz (or 300V DC) on these pins. The other ones are powered with safety extra low voltage (SELV).

Wiring • 3 position VT+ models



## Positioning function



## Learning mode

- Put the power on
- With the « **Next Mode** » and « **Ok Mode** » buttons, select the learning mode (the **APPR led** is on)
- Press « **APPR Close** » button to drive the valve up to its closed position and keep both « **APPR Close** » and « **APPR Mem** » buttons pressed during **2 seconds**.
- The **APPR1 led** blinks and lights up. The closed position is correctly recorded
- Press « **APPR Open** » button to drive the valve up to its open position and keep both « **APPR Open** » and « **APPR Mem** » buttons pressed during **2 seconds**.
- The **APPR2 led** blinks and lights up. The open position is correctly recorded

Both open and closed positions are recorded. Select positioning (POSI) mode and press « **OK Mode** » to confirm.

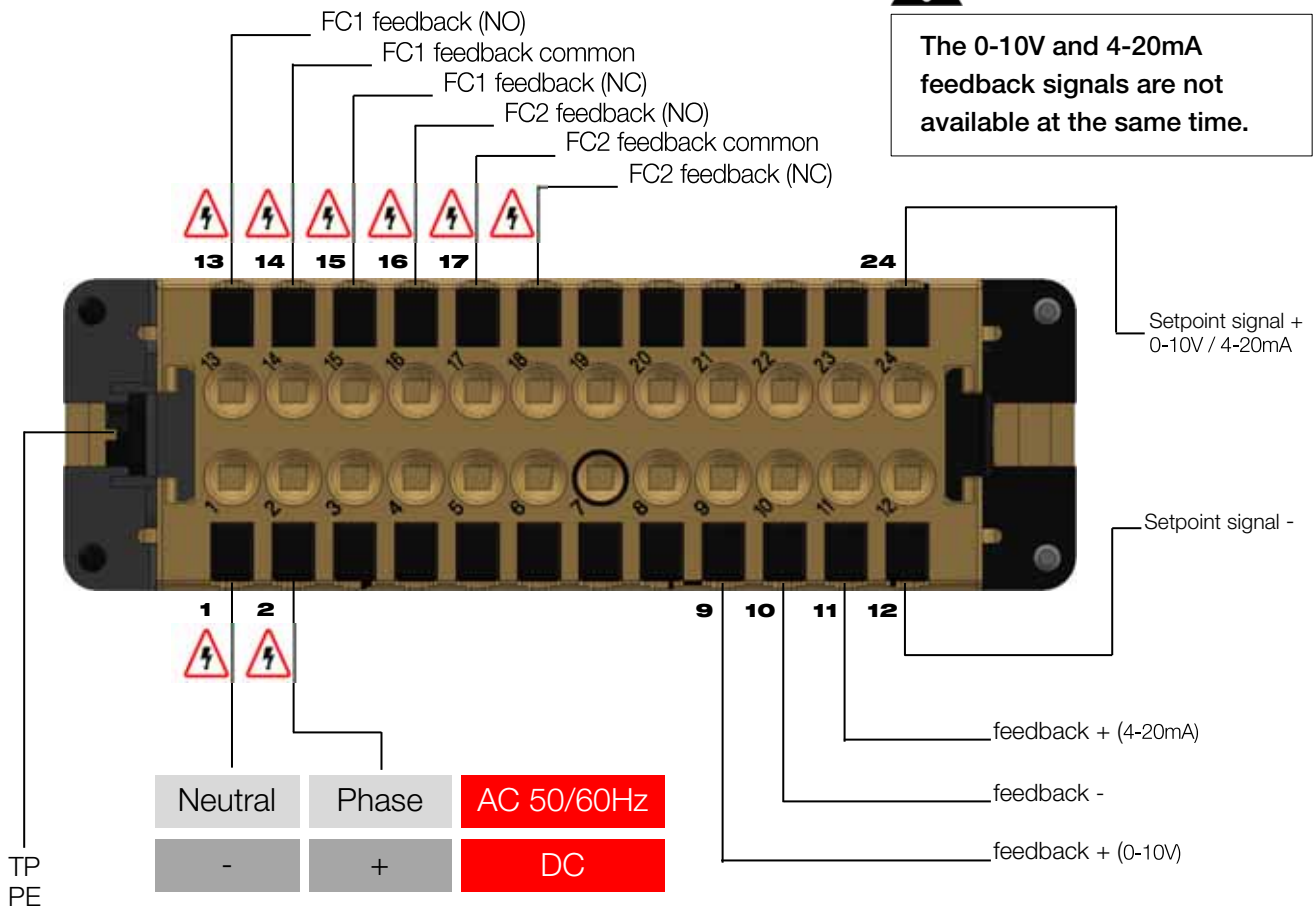
## Setpoint signal

The actuator positions itself according to the setpoint signal. Two signal types are available, a 0-10V range voltage signal or a 4-20mA range current signal. It's possible to change this signal using the **AXMART**® software without modifying the electric wiring.

## Feedback

According to its position, the actuator will provide a proportional voltage signal (0-10V) or a current signal (4-20mA). It's possible to modify the feedback signal using the **AXMART**® software, but it requires changing the wiring.

## Positioning function: wiring



- The earth (TP/PE) and the pins 1, 2, 3, 4 must be wired through the same cable.
- Possible presence of 250V 50/60Hz (or 300V DC) on these pins. The other ones are powered with safety extra low voltage (SELV).

## Bluetooth® function



### Actuator status

Thanks to AXMART®, it's possible to access to all actuator parameters in real time.

### Actuator setup

Thanks to AXMART®, it's possible to set mode :

- Wiring type in case of wire functioning,
- Setpoint and feedback type in case of positioning functioning mode,
- Initial position in case of power failure (BBPR system).

### Wireless local control

AXMART® software allows the actuator control with maximum range of 20m (in open field).

### Weekly scheduling

Thanks to AXMART® software, the actuator can be programmed to schedule up to 20 tasks weekly repeatable. The actuator will become a stand-alone unit.

For any further information, refer to the operation manual (reference DSBA3304)

## BBPR function (option)

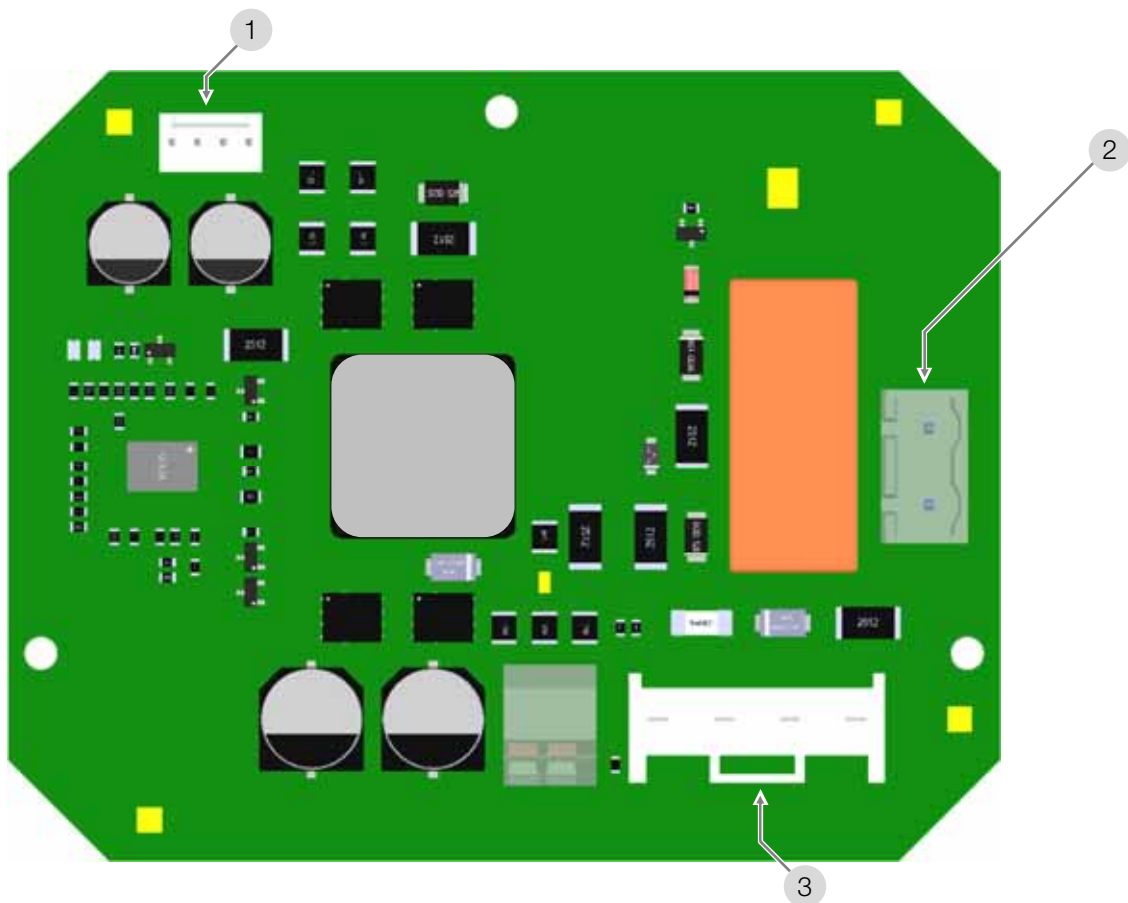
The BBPR function provides the actuator operating into a predetermined security position (open or closed) in case of power failure. This position can be set in AXMART®.

**!** The factory default configuration is "normally closed"

**!** BBPR option required ON/OFF mode

## Loading electronic board

Voltage	24 V DC
Battery capacity	2000 mAh
Charging current	1 A
Discharging current	12 A
Initial charge duration (rapid charging )	2 h 45 min.
Operating temperature	-10 to 40 °C

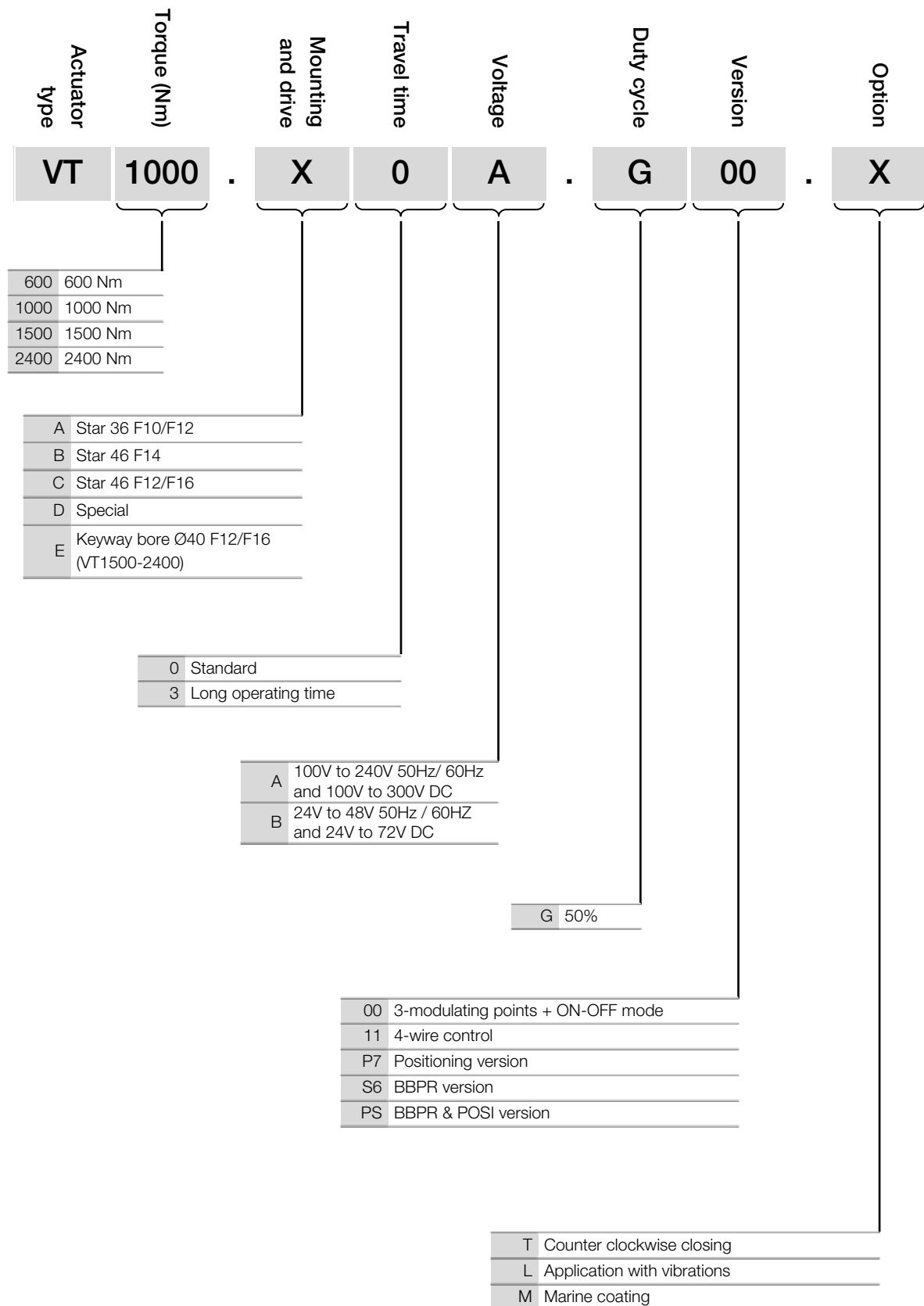


1 Mainboard connector (charge)

3 Battery unit connector

2 Mainboard connector (discharge)

## Codification



## Technical data: 400, 600 and 1000Nm models

### VT400                      VT600                      VT1000

	VT400	VT600	VT1000
<b>Implantation</b>			
Materials	Housing: Aluminium + EPOXY coating Drive: Steel + Zn treatment Shafts and screws : Stainless steel		
Sealing	IP 68		
Environment	Both inside and outside (wet environments possible)		
Operating temperature	-20 °C to +70 °C (BBPR: -10 °C to +40 °C)		
Operating altitude	Altitude up to 2000 m		
Hygrometry	maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C		
Pollution degree	Applicable POLLUTION DEGREE of the intended environment is 2 (in most cases).		
Noise level	63 db		
Weight	25 kg		
<b>Mechanical data</b>			
Maximum torque	400 Nm	600 Nm	1000 Nm
Operating time (90°)	33 s	42 s	65 s
Angular range	90° (180°-270° on request)		
Duty cycle	50 %		
Drive ISO5211	Star 36 - F10/F12		
Manual control	Secured handwheel without clutching system		
<b>Electrical data</b>			
Electric connection	3 x ISO M20 and specific multipin connector		
Technology of motors	Brushless		
Voltages <sup>1)</sup>	100 V to 240 V AC 50/60 Hz and 100 V to 300 V DC 24 V to 48 V AC 50/60 Hz and 24 V to 72 V DC		
Overvoltage category <sup>2)</sup>	TRANSIENT OVERVOLTAGES up to the levels of OVERVOLTAGE CATEGORY II		
Power	300 W		
Maximum current	13 A (example : 24 V : 13 A   110 V : 3 A   230 V : 1.5 A)		
Torque limiter	Electronic		
Number of feedback switches	2 (4 in option)		
Limit switches voltage	12 to 250 V AC and 4 to 24 V DC		
Limit switches current	Min. 100 mA Max. 5 A (resistive), 0.5 A (motor), 0.125 A (capacitive loads)		
Anticondensation heaters	3 x 7 W		

1) The actuator tolerates voltage fluctuation of the electrical grid up to ± 10 % of its nominal system operating voltage

2) The actuator tolerates temporary overvoltages of the electrical grid



## Technical data: 1500 and 2400Nm models

### VT1500

### VT2400

<b>Implantation</b>		
Materials	Housing: Aluminium + EPOXY coating Drive: Steel + Zn treatment Shafts and screws : Stainless steel	
Sealing	IP 68	
Environment	Both inside and outside (wet environments possible)	
Operating temperature	-20°C to +70 °C (BBPR: -10 °C to +40 °C)	
Operating altitude	Altitude up to 2000 m	
Hygrometry	maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C	
Pollution degree	Applicable POLLUTION DEGREE of the intended environment is 2 (in most cases).	
Noise level	63 db	
Weight	57 kg	
<b>Mechanical data</b>		
Maximum torque	1500 Nm	2400 Nm
Operating time (90°)	155 s	210 s
Angular range	90° (180°-270° on request)	
Duty cycle	50 %	
Drive ISO5211	Star 46 - F12/F14/F16	
Manual control	Secured handwheel without clutching system	
<b>Electrical data</b>		
Electric connection	3 x ISO M20 and specific multipin connector	
Technology of motors	Brushless	
Voltages <sup>1)</sup>	100 V to 240 V AC 50/60 Hz and 100 V to 300 V DC 24 V to 48 V AC 50/60 Hz and 24 V to 72 V DC	
Overvoltage category <sup>2)</sup>	TRANSIENT OVERVOLTAGES up to the levels of OVERVOLTAGE CATEGORY II	
Power	300 W	
Maximum current	13 A (example : 24 V : 13 A   110 V : 3 A   230 V : 1.5 A)	
Torque limiter	Electronic	
Number of feedback switches	2 (4 in option)	
Limit switches maximum voltage	4 to 250 V AC/DC (Overvoltage category II)	
Limit switches maximum current	1 mA to 5 A max.	
Anticondensation heaters	3 x 7 W	

1) The actuator tolerates voltage fluctuation of the electrical grid up to ± 10 % of its nominal system operating voltage

2) The actuator tolerates temporary overvoltages of the electrical grid

# **CR-TEC Engineering Inc.**

---

**CR-TEC Engineering Inc.**

15 Orchard Park Road, Unit 18  
Telephone 203-318-9500 • Fax 203-245-2575  
info@crtec.com • www.crtec.com