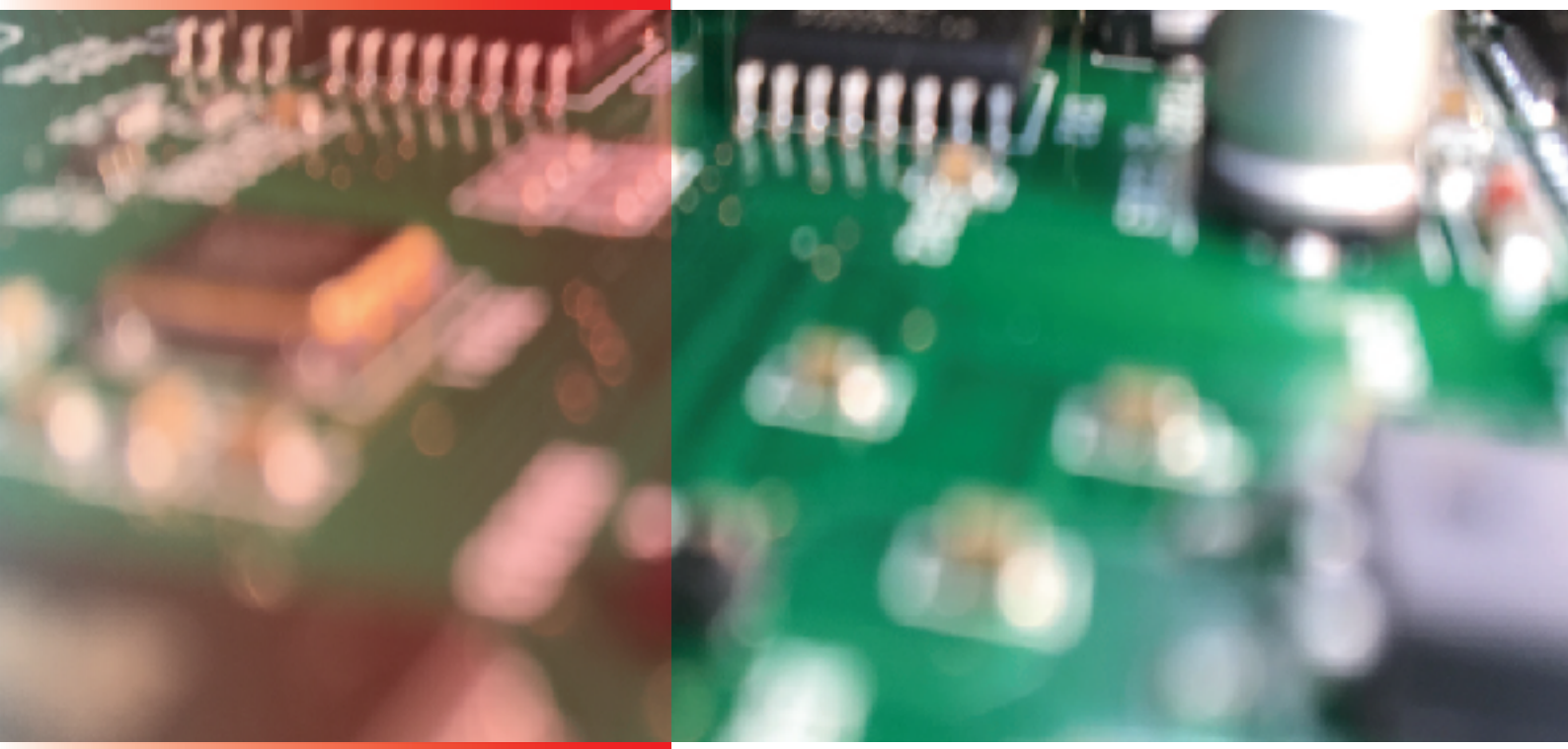
ADX UV JET



System Manual

I. Table of contents

II. Foreword

A. Notes on This documentation

This description is only intended for the use of trained specialist in control, automation and electrical engineering who are familiar with the applicable national standards.
It is essential that the following notes and explanations are followed when installing and commissioning these components.

The responsible staff must ensure that the application or use of the products described satisfy all the requirement for safety, laws, regulations, guidelines and standards.

Disclaimer

The documentation has been prepared with the best care. The products described are, however, constantly in development.
For that reason the documentation is not in every case checked for consistency with performance data, standards and other characteristics.
If it contains technical or editorial errors, we retain the right to make alteration at any time and without warning.
No claims for the modification of the products that have already been supplied may be made based on the data, diagrams and descriptions in this documentation.

B. Documentation Issue status

Version	Comment
1.0	First Published

C. Appropriate use

The motor drives from ADX Systems SA are designed to operate three-phase current high-speed motors. The maximum permissible effective motor voltage must be at least equal to the effective mains voltage fed into the drive.

The drives from ADX Systems SA are designed for the installation as component in electrical systems or machines and may be operated only as integrated system or machine components.

The servo drives may only be operated in enclosed control cabinets in accordance with the conditions described in the “Technical data” section.

Caution – Risk of injury!

Despite all hardware and software protections the electronic equipment is not fail-safe. The machine manufacturer is responsible for ensuring that the connected motors and the machine are brought into a safe state in the event of a fault in the drive system.

III. Safety

A. Personnel qualification

This description is only intended for trained specialist in control, automation, electrical and drive engineering who are familiar with the applicable national standards.

B. Description of safety symbols

 DANGER	**Serious risk of injury!** Failure to follow the safety instructions associated with this symbol directly endangers the life and health of persons.
 WARNING	**Caution – Risk of injury!** Failure to follow the safety instructions associated with this symbol endangers the life ans health of persons.
 CAUTION	**Personal injuries!** Failure to follow the safety instructions associated with this symbol can be lead to injuries to persons.
 Attention	**Damage to the enviroment or devices!** Failure to follow the safety instructions associated with this symbol can be lead to damage to the environment or equipment.
 Note	**Tip or pointer** This symbol indicates information that contributes to better understanding.

C. Special safety instruction for ADX drives

Serious risk of injury through high electrical voltage!

- Never open the drive when it is live. Wait until the DC link capacitors are discharges. The voltage measure between DC+ and DC- terminal (If present) must have fallen below 50V. Opening the device invalidates all warranty and liability claims.
- Negligent, improper handling of the drive and bypassing of the safety devices can lead to personal injury or death through electric shock.
- Ensure that the cable and connector are connected properly and free of breach.
- Disconnect the drive from the mains supply and secure it against reconnection before connecting or disconnecting the pluggable terminals.
- Disconnect the drive from the mains supply and secure it against reconnection before working on electrical part with a voltage > 50V.
- Due to the DC link capacitors, dangerous voltage may persist at the DC link, after disconnecting the drive wait at least 5 minutes.

Serious risk of injury through hot surfaces!

- The surface temperature may exceed 50°C, resulting in a risk of burns.
- Avoid touching the case during or shortly after operation.
- Leave the drive to cool down for at least 15 minutes after it is switched off.
- Use a thermometer to check whether the surface has cool down sufficiently.

Danger of injury due to uncontrolled movements!

Read and take note of the important information for commissioning each time before commissioning a drive.

Hazard to persons!

- Carefully read this manual before using the drive thoroughly, paying particular attention to the safety instruction. In the event of any uncertainties please notify your sales office immediately and refrain from working on the drive.
- Only trained, qualified electricians with sound knowledge of drive equipment may work on the device.
- During the electrical installation, it is essential to ensure that the correct fuses/protective circuit breakers are used between the mains supply and the drive. Further information can be found in “electrical installation”.
- If a drive is installed in a machine it must not be commissioned until proof of compliance of the machine with the latest version of the EC Machinery directive has been provided. This includes all relevant harmonised standards and regulations required for implementation of this directive in national legislation.

Attention

Hazard to equipment and environment!

- During installation, it is essential to ensure that the specified ventilation clearances and climatic conditions are adhered to. Further information can be found in the “Technical data” and “Mechanical installation”.
- If the drive is operated in contaminated ambient air, the cooling openings must be checked regularly for blockage. These checks should be carried out up to several times per day.
- The drive contains components at risk from electrostatic discharge caused by improper handling:
    - Please ensure you are electrostatically discharged before touching the drive directly.
    - Avoid contact with highly insulating material (synthetic fibres, Plastic film etc.).
    - Place the drive on a conductive surface.
    - Do not touch the motor plug or shield during operation of the drive.

IV. Handling

A. Transport and storage

Transport

- Only by qualified personnel
- Only in recyclable original manufacturer’s packaging
- Avoid sharp impacts
- Temperature: -40…. +70°C, varying no faster than 20K/hour
- Air Humidity: Relative humidity max. 95%, non-condensing
- The drive contains components at risk from electrostatic discharge caused by improper handling:
    - Please ensure you are electrostatically discharged before touching the drive directly.
    - Avoid contact with highly insulating material (synthetic fibres, Plastic film etc.).
    - Place the drive on a conductive surface
- If the packaging is damaged check the drive and any accessories for visible damage. Inform the transport company and, if necessary, the manufacturer.

Storage

- The devices and its accessories must not be stored outdoors. The storage space must be adequately ventilated and dry.
- The devices must be stored in the recyclable original manufacturer’s packaging.
- The drive contains components at risk from electrostatic discharge caused by improper handling:
    - Please ensure you are electrostatically discharged before touching the drive directly.
    - Avoid contact with highly insulating material (synthetic fibres, Plastic film etc.).
    - Place the drive on a conductive surface
- Max stack height 8 cartons
- Storage temperature: -40…. +55°C, varying no faster than 20K/hour
- Air Humidity: Relative humidity max. 95%, non-condensing

- Duration of storage:
  - < 5 years: No limitation.
  - >5 years: The dielectric (an oxidation layer with a thickness of approx. 1um) in the Dc link capacitors degrades over time, and the capacitors lose their forming.
    Prior to commissioning of the drive the capacitor must be reformed.
    Release all electrical connections and feed the drive for about 30 minutes with 230VAC single phase at terminal L1/L2.

Attention

B. Disposal

- Screw connections enable the drives to be dismantled into main components (aluminium heat sink, steel case, PCBs)
- The device should be disposed of by a certified disposal company.
- Metal part can be sent for metal recycling.
- Electronic parts such as circuit boards and terminals must be disposed of in accordance with the national electronics scrap regulations.

C. Servicing

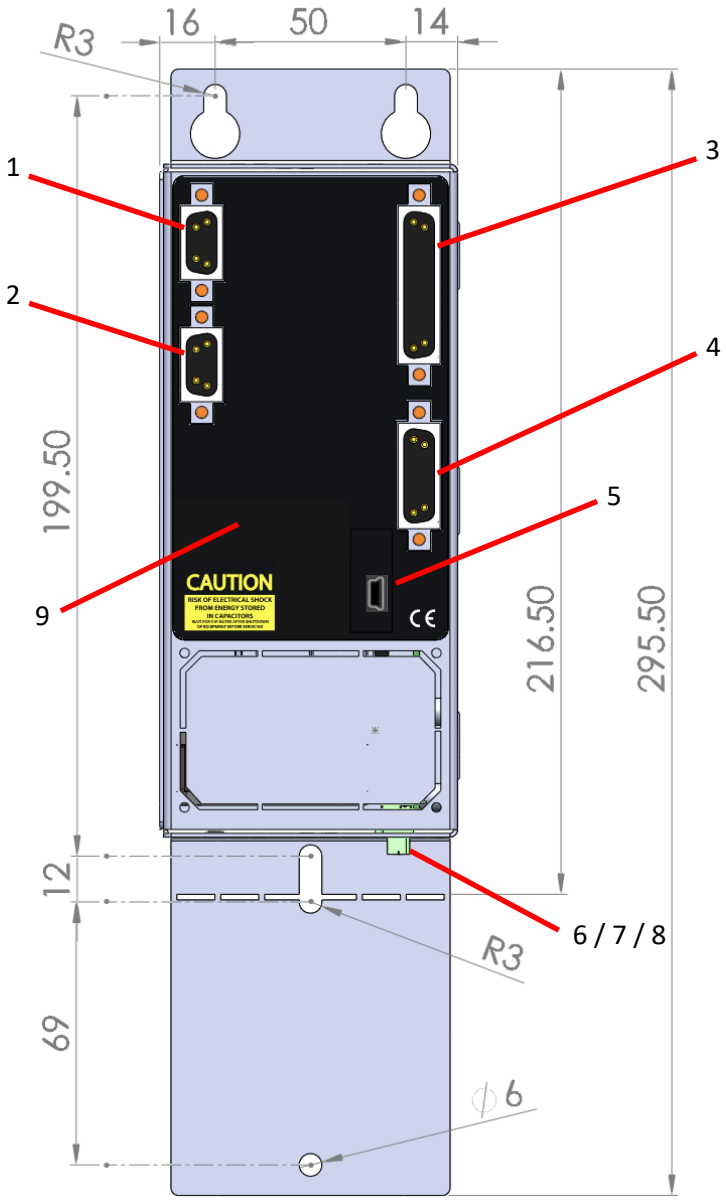
- The device is maintenance-free
- Opening the device invalidates the warranty

D. Cleaning

- Soiled housing: Clean with isopropanol or similar **(Do not immerse or spray!)**
- Contamination inside the device: Cleaning by manufacturer
- Soiled fan guard: Clean with (dry) brush

V. Product Overview

N°	Designation
1	**XCNC** – Simulated encoder Out (Sub-D9 F)
2	**XENC2** – Encoder feedback 2 (Sub-D9 M)
3	**XIO -** Interface connector (Sub-D25 F)
4	**XENC -** Encoder feedback (Sub-D15 F)
5	Mini USB connection
6	**XSFT**: Power supply 24VDC and Optional STO SIL3 connector (Safe torque off)
7	**XMOT**: Motor connection (4 pos. Male connection)
8	**XLINE**: Drive Line connection (4 pos. Female connector)
9	Model name plate



VI. General

A. Introduction

The ADX Universal voltage drive series is a single axis drive and is optimised in term of function and cost-effectiveness keeping the highest Swiss quality standards.

The ADX drive system allow easy operation and setup through a modern and easy to use user software. The system enables simple and fast connection with various pluggable connector for an easy setup and exchange if necessary.

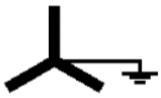
B. Technical data

Technical data	ADX015
Ambient temperature during operation	0°C to +40°C – When using the drive to its maximum, to keep the ambient temperature within limits it's advised to use forced ventilation on the electrical cabinet with a minimum of 10 CFM flow per axis.
Ambient temperature for transportation	-25°C to +70°C
Ambient temperature for storage	-25°C to +55°C
Air Humidity	5% to 85% non-condensing
Corrosion protection	Under extreme operating conditions (known corrosive environment), special measures must be agreed with the manufacturer and implemented by the user.
Operating Altitude	Up to 1000m above sea level without restrictions, from 1000m to 2500m max with power reduction (2%/100m)
Permissible installation position	Vertical
Ventilation	Built-in temperature-controlled fan
Protection class	IP 20
Special operation conditions	The usability of ADX drives under harsh operating conditions or other unfavourable conditions must be ascertained individually in consultation between the manufacturer and the user.

C. Electrical data

Technical data	ADX_UV_JET05	ADX_UV_JET010
Rated continuous output current (RMS)	5A	10A
Rated maximum output current (RMS)	10A	20A
Rated supply voltage (45-65 Hz)	1 or 3 x 110 to 420VAC	
Max. DC link voltage	700 VDC	
Rated apparent power 110VAC supply 230VAC supply 420VAC supply	 950 W 1.9 kW 3.6 kW	 1.9 kW 3.9 kW 7.2 kW
Continuous braking power (int.)	120W	
Peak braking power (int.)	1500W	
DC link capacity	940u	
PWM Switching frequency	10 or 20kHz	
Motor output frequency	0 to 2000Hz	
Max theoretical motor speed	120k Rpm	

Attention



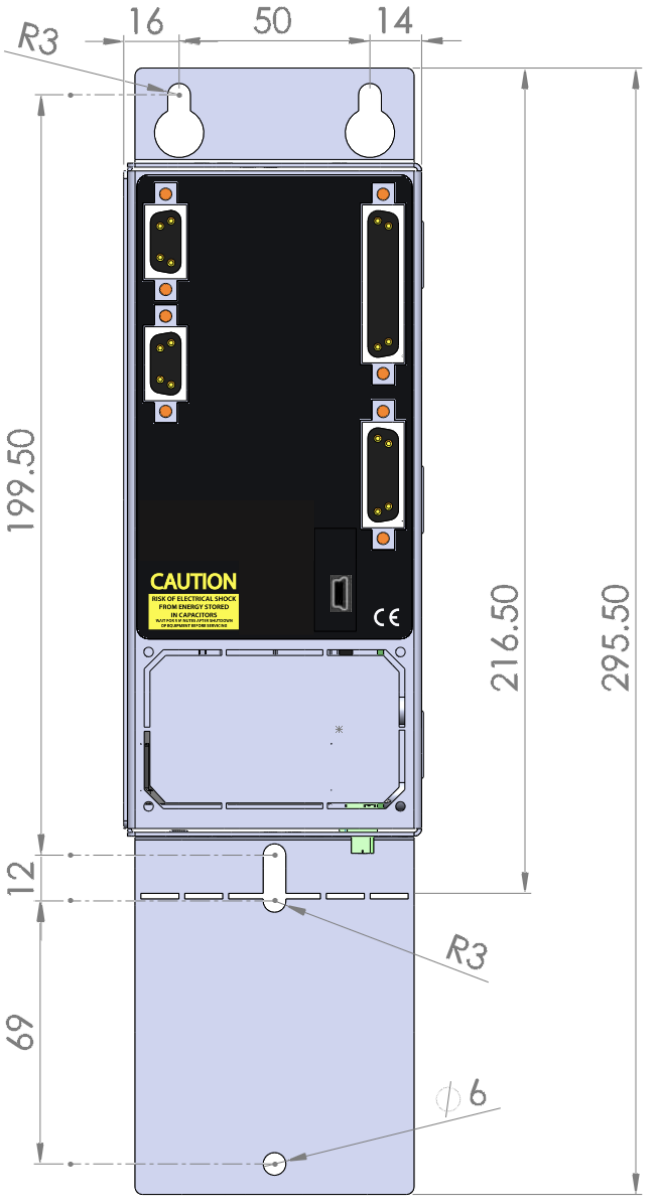
ADX drive shall be connected only to a grounded wye-source!

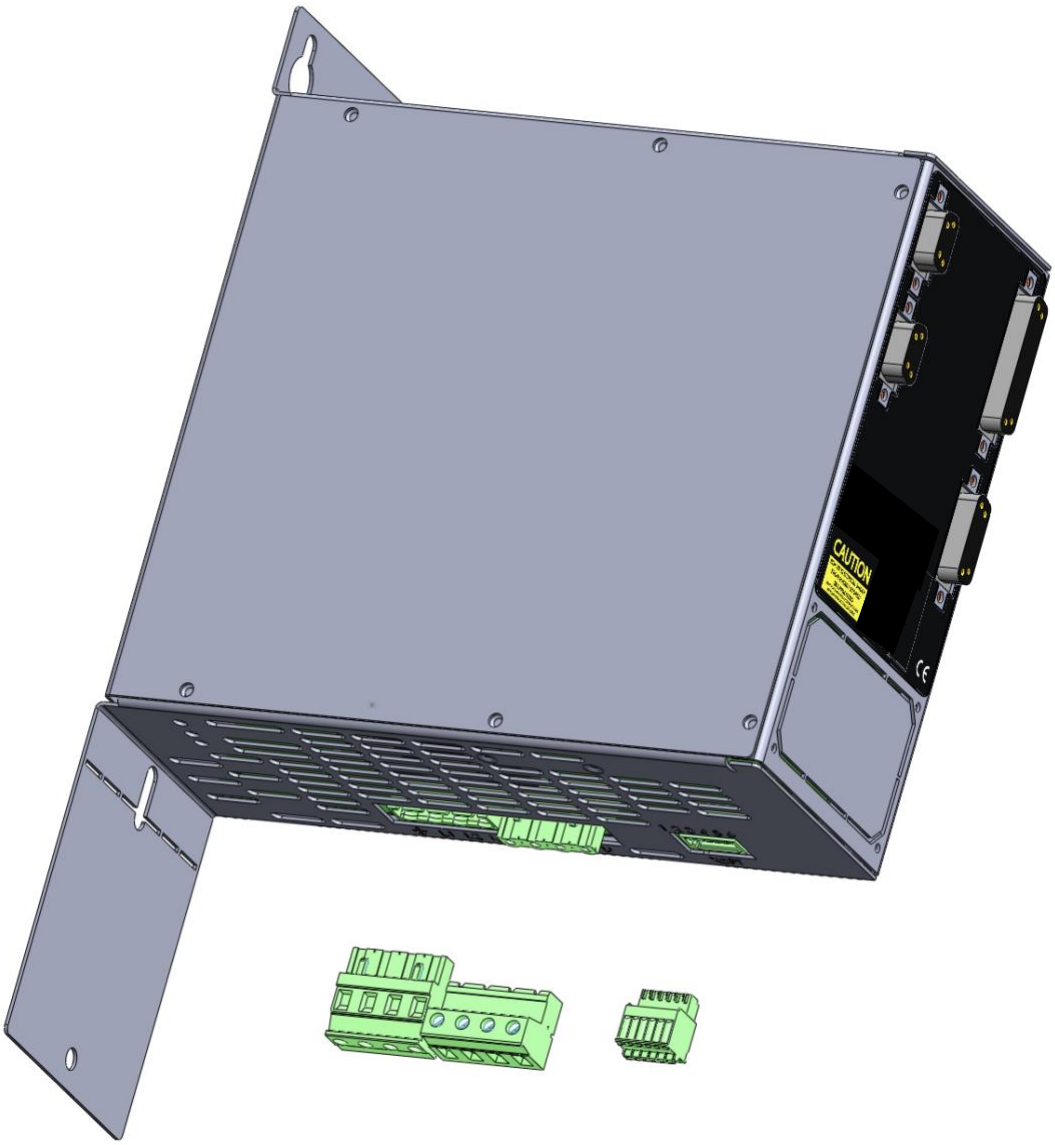
D. Mechanical data

Mechanical data	
Weight	Approx 2.5Kg
Width	83 mm
Height without plugs	295 or 216 mm
Depth without plugs	220 mm

E. Dimensions

All measurements are in millimetres.




CAUTION

VII. Properties

- High speed Servo specialized drive
- Wide voltage ranges from 110 to 420VAC single or three phases
- DC link management and integrated braking resistor
- Encoder feedback
- High speed capture inputs
- High speed Space Vector Modulation (SVM) and current control
- Optional LCD touchscreen display for comprehensive user HMI
- Easy to use user software with USB connection
- Optional safe torque off SIL-3 hardware function
- Integrated temperature control with fan
- Compact design for simple control cabinet installation

VIII. Mechanical installation

Caution – Risk of injury!

- The drives may only be installed by trained, qualified personnel. The qualified personnel must know and comply with the national accident prevention regulations.
- Safety boots must be worn.

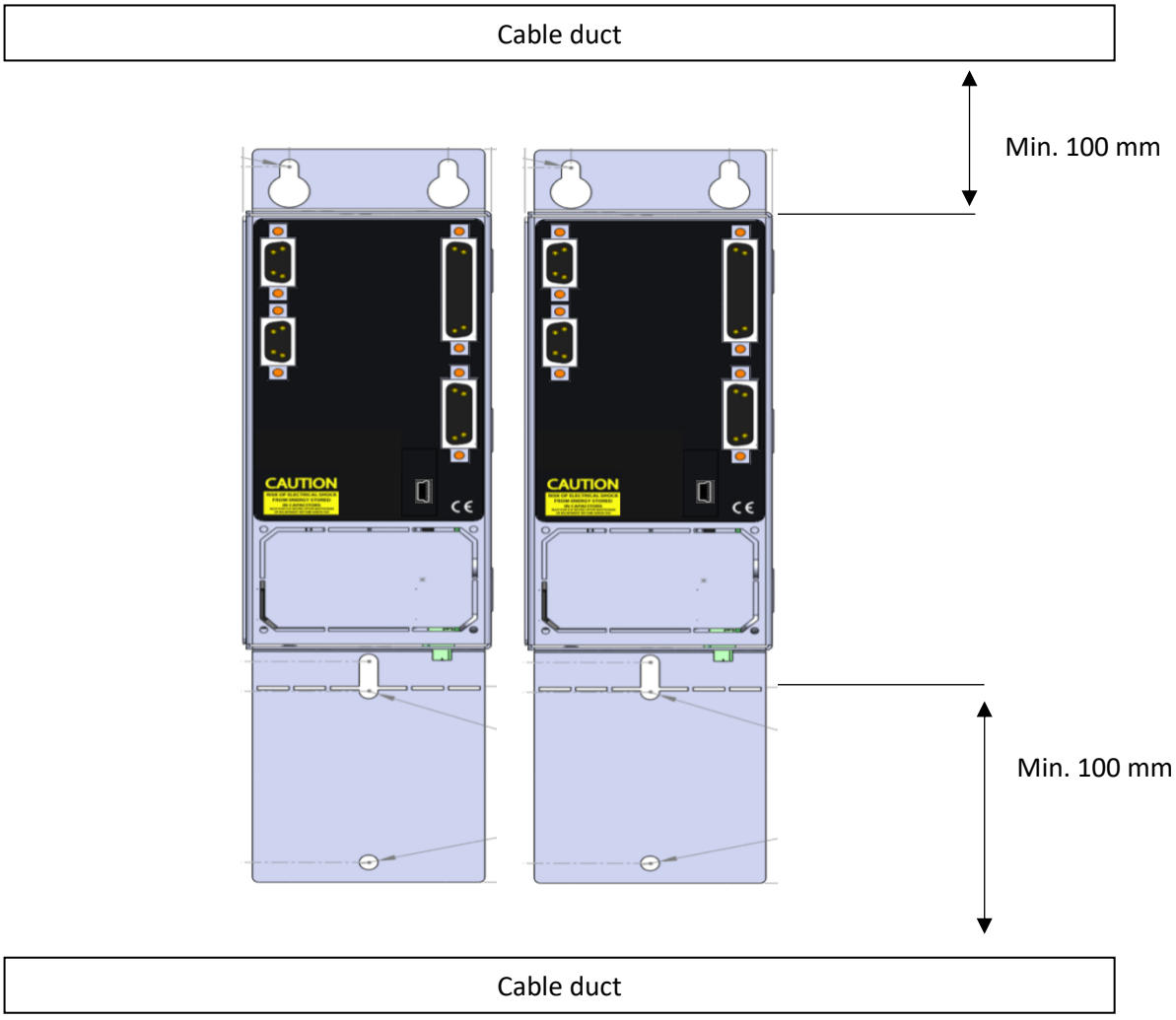
Caution – Risk of injury through electric shock!

- De-energise all electrical components (Drives, control cabinet, etc.) before starting the installation or deinstallation.

Destruction of the drive!

- Always install the drive vertically.
- Provide adequate ventilation for the drive. The permissible ambient conditions are specified in the “Technical data” section.
- It is essential to adhere to the required distances (see below diagrams).

A. Installation example



WARNING

Caution – Risk of injury through electric shock!

- Take care that the mounting plate is earthed (grounded) properly.

Attention

Grounding!

- If the ground connection of the drive is not done as specified it is possible to get trouble with some EMC issues.

IX. Electrical installation

Caution – Risk of injury!

- The drives may only be installed by trained, qualified personnel. The qualified personnel must know and comply with the national accident prevention regulations.
- Safety boots must be worn.

Caution – Risk of injury through electric shock!

- De-energise all electrical components (Drives, control cabinet, etc.) and wait at least 5 minutes before starting the installation or deinstallation.

Serious risk of injury though electric shock!

- Due to the DC link capacitors, dangerous voltage may persist at the DC link contact (if present) after the drive has been disconnected from the main supply. After disconnecting the drive wait at least 5 minutes, the device is safe once the DC link voltage has fallen below 50VDC.

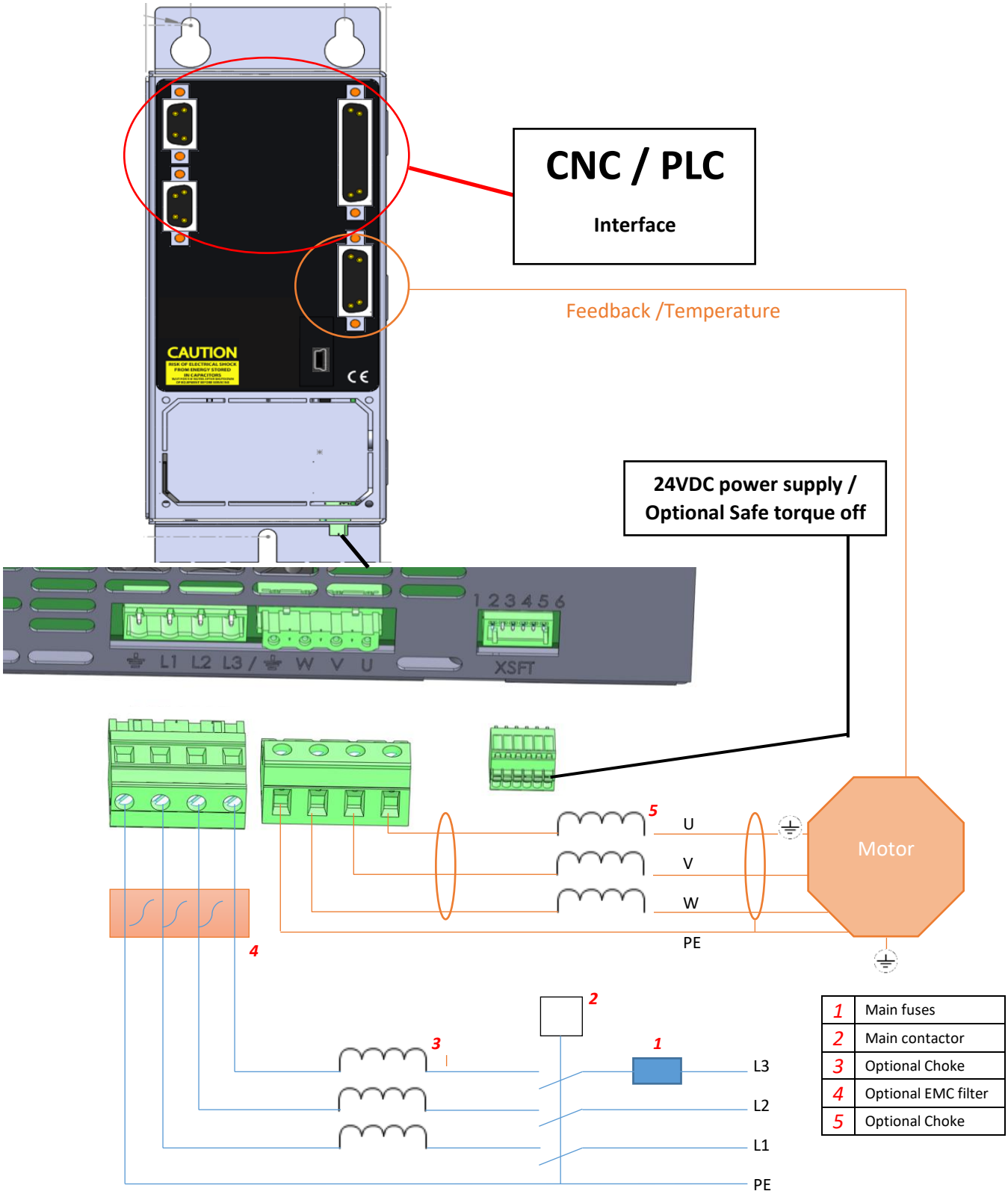
Caution – Risk of injury through electric shock!

- Before installation, wiring and commissioning it is essential to read the section on “safety”.
- Before installing, uninstalling or connecting the drive and motors please note the following:
  - Remove all relevant main fuses
  - Switch off the main system switch and secure it with a lock
  - Put up a warning sign
- The control and power connection for the motors may be live, even if the motor is prevented from rotating by any mechanical constrain.

Destruction of the drive!

- Check the rated voltage and current of the drive and the connected motor(s).

A. Connection Diagram



1	Main fuses
2	Main contactor
3	Optional Choke
4	Optional EMC filter
5	Optional Choke

B. Power supply & Safety

1. XLINE Main supply connection

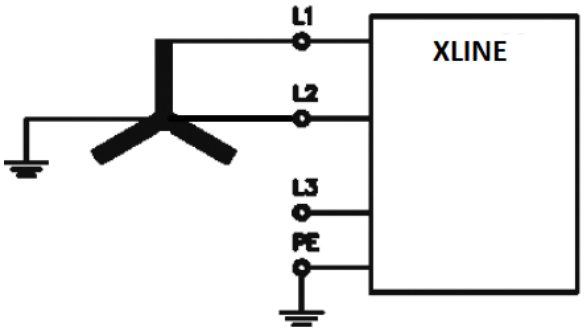
Voltage system single or three phased 110VAC to 420VAC can be connected to the XLINE connector.

The maximum admissible wire is 2.5 mm^2.

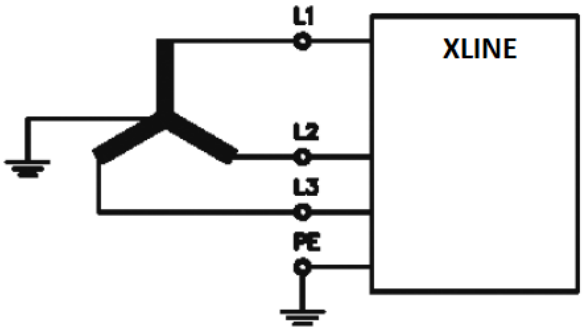
Terminal point	Connection	
	1-Phase	3-Phases
PE	Protective conductor	Protective conductor
L1	Phase L1	Phase L1
L2/N	Neutral conductor	Phase L2
L3	Not Used	Phase L3

Connection to the standard mains supply (TT/TN) with earthed centre

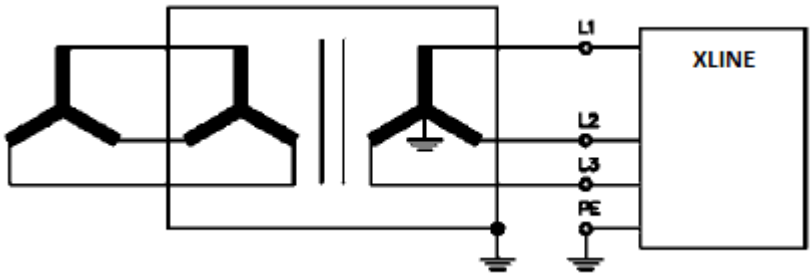
Single Phase:



Three-Phases:



With Isolating transformer:



2. Fusing

	ADX_UV_JET05	ADX_UV_JET10
AC supply*	10AT	20AT

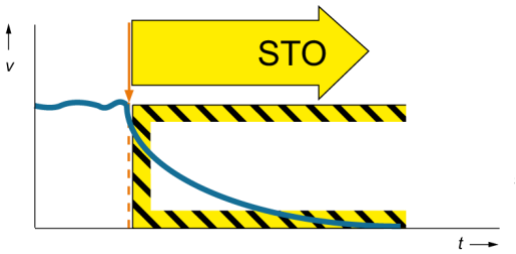
*Application class ”gG” Mains fuses or “C” type automatic circuit-breakers must be used

3. XSFT – Power supply and Safe torque off SIL 3 PL d (optional)

XSFT pos. n°	Description	Electrical data
1	GND	Drive GND
2	STO_A_NEG	Isolated ground for STO_A_POS
3	STO_B_NEG	Isolated ground for STO_B_POS
4	STO_A_POS	Nominal voltage 24VDC, voltage range 19-28 VDC, related to STO_A_NEG, Nominal current 10 mA
5	STO_B_POS	Nominal voltage 24VDC, voltage range 19-28 VDC, related to STO_B_NEG, Nominal current 10 mA
6	24VDC	Drive 24VDC supply input, voltage range 22-26VDC, Max 2 A, related to GND

Note: Only the STO is optional, providing 24VDC to the drive is mandatory.

The STO (safe torque off) is a safety function that prevent motor driving torque in an emergency event.



In order to reach the highest level of safety (SIL-3), the STO hardware implementation is composed of two redundant lines (STO_A/STO_B), the deactivation of a single of these lines will conduct to an immediate loss of motor driving torque.

The STO can also be use in standstill to avoid motor operation.

If the STO is not satisfied, a fault is present on the drive through the firmware and can be notified to an external device via an external output of the drive (not safety relevant as triggered by software), however the STO function is totally independent of the firmware operation as it is a pure hardware function.

When the STO is not connected it is virtually impossible to apply power to the motor.

WARNING

Caution – Risk of injury through electric shock!

- The STO function does not provide protection against electric shock, only against hazardous movements.

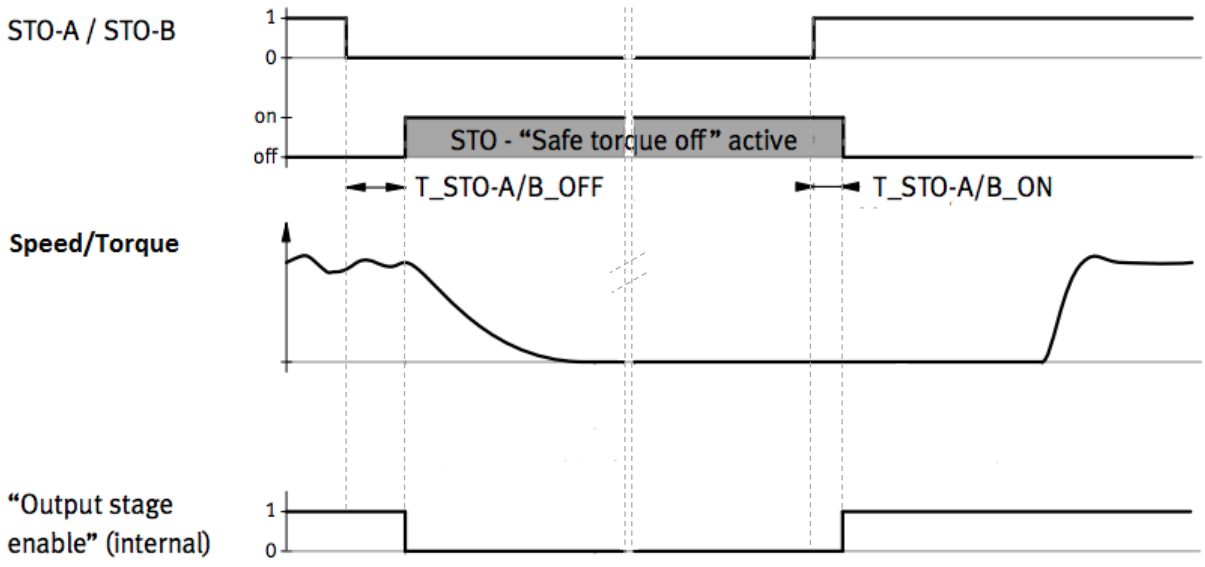
Attention

Note

- The STO function is insufficient as a sole safety function for drives subject to permanent torque or force (e.g. Suspended loads).
- Bypassing of safety equipment is impermissible.
- Repair of the controller is impermissible.
- If the control ports STO_A or STO_B are deactivated with an active output stage, it will result in uncontrolled coasting of the motor. If uncontrolled coasting can result in a hazard or damage, additional measures are required. Stop function Category 0 – EN 60204-1:2007-6 / ISO 13849.
- SIL 3 – IEC 61508
- PL d – ISO 13849
- In the unlikely event of a failure of the motor controller output phase during STO status (simultaneous short circuit of 2 power semiconductors in different phases) may result in a limited movement of the rotor. The rotation angle / path corresponds to a pole pitch.
  Examples: – Rotary axis, synchronous machine, 4-pole pairs < 45° at the motor shaft. – Linear motor, pole pitch 20 mm movement < 20 mm at the moving part.

WARNING

With this option, the **output stage of the drive is only active** when the STO_A and STO_B positions are powered.



T_STO-A/B_OFF and T_STO-A/B_ON, Nominal 5 ms, Max 10 ms.

The safety function STO (safe torque off) is requested via the two control ports STO-A and STO-B.

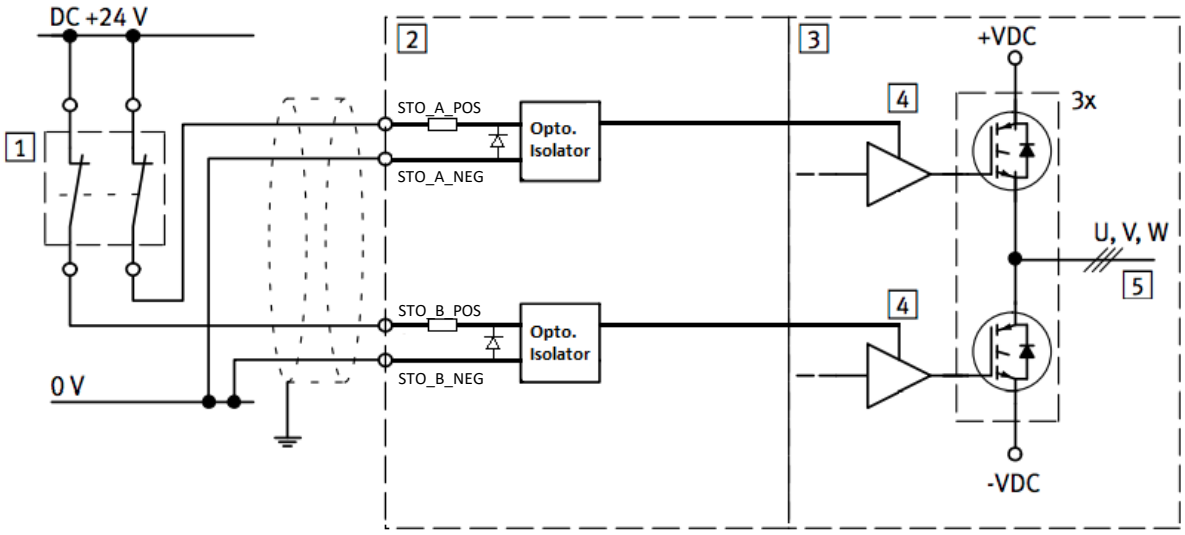
These control ports permit the direct connection of safe semiconductor outputs:

- Electronic safety switching devices

- Active safety sensors, e.g. light curtains with OSSD signals
- Switch contacts (safety switching devices with relay outputs, passive safety sensors, e. g. forced position switches).

To request the safety function STO (safe torque off), the 24 V control voltage at both control ports STO-A and STO-B is switched off (0 V). If the two control ports are switched off simultaneously the STO function is active. If both channels are not actuated simultaneously, the STO function is nevertheless active at the first request. If a channel is not switched off, it is interpreted as an error and results in an error message being issued.

a) Description of safety function



[1] Safety command device (e.g. Switch relay, safety switching device)
[2] Integrated safety STO function
[3] Power stage of the drive
[4] Driver enable
[5] Motor connection

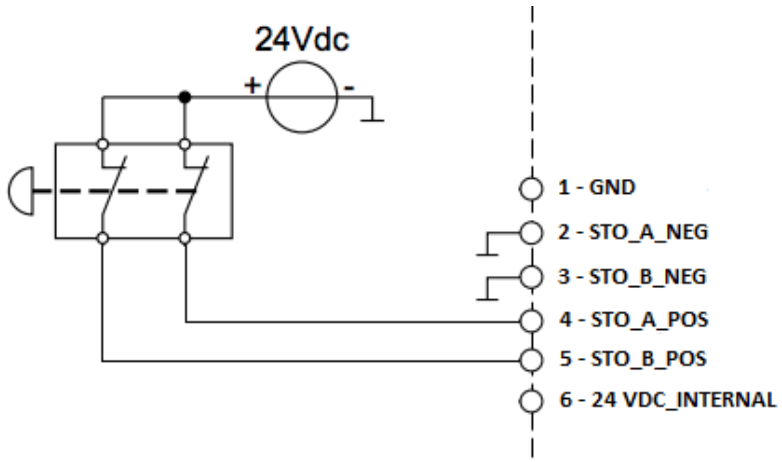
b) OSSD compatibility

OSSD (Output Signal Switching Device) are test pulses for safety control, they allow the safety device emitting them to check periodically for any circuit issue such as short.

Those pulses are tolerated and therefore do not cause an activation of the STO function. The maximum test pulse width tolerated is 2 ms of off state.

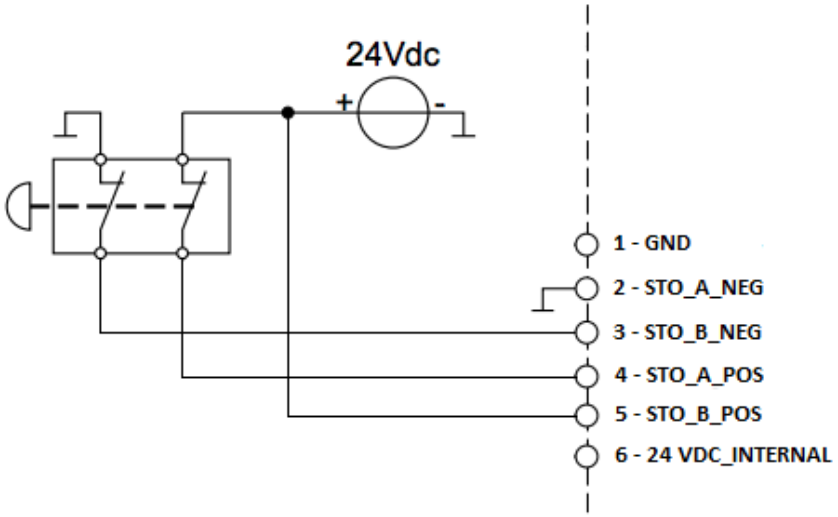
c) Wiring examples

1. Direct wiring to an emergency stop switch



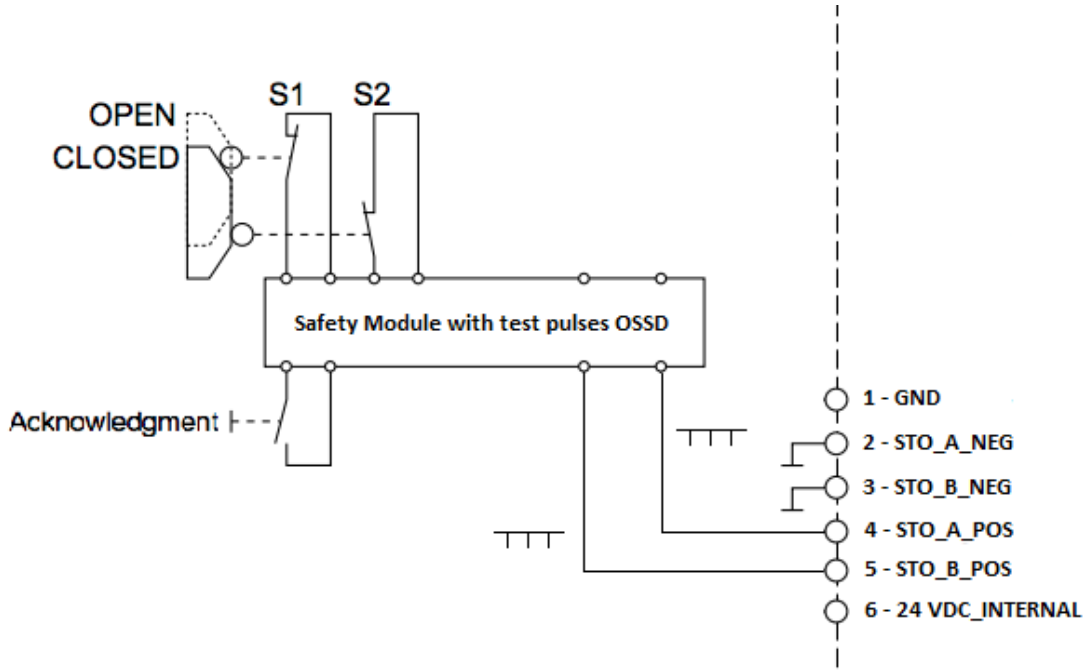
Any kind of safety switches can be connected in the same manner (e. g. safety door switches).

2. Direct wiring to an emergency stop switch with wiring monitoring



Any kind of safety switches can be connected in the same manner (e. g. safety door switches).

3. Connection to a safety module with OSSD test pulses



Any kind of safety switches can be connected to the safety module (e. g. safety door switches).

4. XMOT - Motor connection

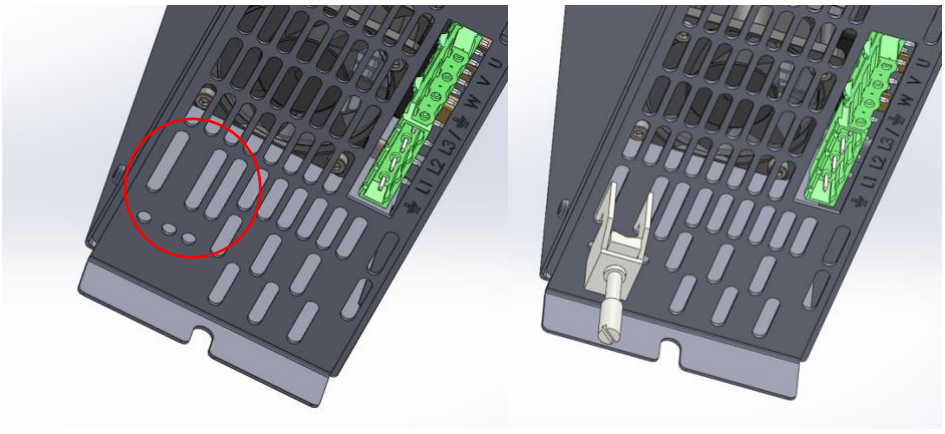
XMOT is a 4 positions connector PE / W / V / U.

Attention

Grounding shield!

The grounding shield of the motor's cable must be connected via the shield clamp of the electrical cabinet or to the drive case by shield connection clamp SK 8 – 3025163 or SK14 – 3025176 of Phoenix contact (Not provided), please pay a particular attention to the cable arrangement and avoid blocking the cooling fan inlet with inadequate cable routing.

Example with SK 8 Shield connection clamp:



C. Control I/Os

1. XIO – General Interface – Sub DB-25F

Counter Connector	Pin	I/O	Name	Meaning	Default function
Sub DB-25M 	1	I	24VDC	Drive 24VDC supply input, voltage range 22-26VDC, Max 2 A, related to GND. Can replace XSFT 24VDC connection. (2)	
	2	I	AIN	Differential analogic input +/-10V(5)	
	3	I	AIN_B	Differential analogic input +/-10V(5)	
	4	NA	NC	No connect	
	5	I/O	RELAYCOM	COMMON of Relay	
	6	I/O	RA	Relay contact A _ Normally closed(1)	
	7	I/O	RB	Relay contact B _ Normally open(1)	
	8	I/O	GND	Ground	
	9	I/O	MCC	Digital Outputs common	
	10	I/O	MO_4	Multi. digital output 4 (1)	
	11	I/O	MO_3	Multi. digital output 3 (1)	Speed reached
	12	I/O	MO_2	Multi. digital output 2 (1)	Non-Zero speed
	13	I/O	MO_1	Multi. digital output 1 (1)	Drive operational
	14	I/O	GND	Ground	
	15	O	12VDC OUT	12 VDC supply voltage, limited to 100 mA (2)	
	16	NA	NC	No connect	
	17	I/O	GND	Ground	
	18	I/O	GNDIO	Ground for Isolated digital inputs	
	19	I	MI4	Multi. digital Input 4 (1) (3)	Reset
	20	I	MI3	Multi. digital Input 3 (1) (3)	
	21	I	MI2	Multi. digital Input 2 (1) (3)	External control selection (6)
	22	I	MI1	Multi. digital Input 1 (1) (3)	Internal set point selection (6)
	23	I	ENABLE 2_MI0	ENABLE 2 _ Multi. digital Input 0 (1) (3)	Start / Stop (6)
	24	I	ENABLE 1	ENABLE 1 (3)	Enable drive (6)
	25	O	24VDC OUT	22-26VDC supply voltage, limited to 100 mA (2)	

[1] Configurable via ADM software, [2] Referenced to GND, [3] Reference to GNDIO, [4] Not mandatory, [5] Prefer the use of shielded twisted pair cable for noise immunity, (6) Refer to motor start truth table with default I/O settings.

2. XENC1 – Encoder Input 1 – Sub DB-15F

Counter Connector	Pin	I/O	Name	Meaning
Sub DB-15M 	1	I	TMOT+	Motor temperature sensor +[3]
	2	O	24VDC OUT	24 VDC supply voltage, limited to 100 mA
	3	I	AIN	Differential Digital Input-Channel A-TTL[2] [3]
	4	I	AINB	Differential Digital Input-Channel A-TTL[2] [3]
	5	I	BIN	Differential Digital Input-Channel B-TTL[2] [3]
	6	I	Hall1_IN	Hall sensor input 1
	7	I	Hall2_IN	Hall sensor input 2
	8	O	5VDC OUT	5 VDC supply voltage, limited to 100 mA
	9	O	12VDC OUT	12 VDC supply voltage, limited to 100 mA
	10	I	TMOT-	Motor temperature sensor -[3]
	11	I	Hall3_IN	Hall sensor input 3
	12	I/O	GND	Ground
	13	I	BINB	Differential Digital Input-Channel B-TTL[2] [3]
	14	I	ZIN	Differential Digital Input-Channel Z-TTL[2] [3]
	15	I	ZINB	Differential Digital Input-Channel Z-TTL[2] [3]

[2] Prefer the use of shielded twisted pair cable for noise immunity, [3] Configurable via ADM software.

3. XCNC – CNC simulated encoder output – Sub DB-9F

Counter connector	Pin	I/O	Name	Meaning
Sub DB-9M 	1	O	AOUT	Differential Digital Input-Channel A-TTL[2] [3]
	2	O	BOUT	Differential Digital Input-Channel B-TTL[2] [3]
	3	O	ZOUT	Differential Digital Input-Channel Z-TTL[2] [3]
	4	I/O	GND	Ground
	5	NA	NC	Not connected
	6	O	AOUTB	Differential Digital Input-Channel A-TTL[2] [3]
	7	O	BOUTB	Differential Digital Input-Channel B-TTL[2] [3]
	8	O	ZOUTB	Differential Digital Input-Channel Z-TTL[2] [3]
	9	NA	NC	Not connected

[2] Prefer the use of individual shielded twisted pair cable for noise immunity, [3] Configurable via ADM software.

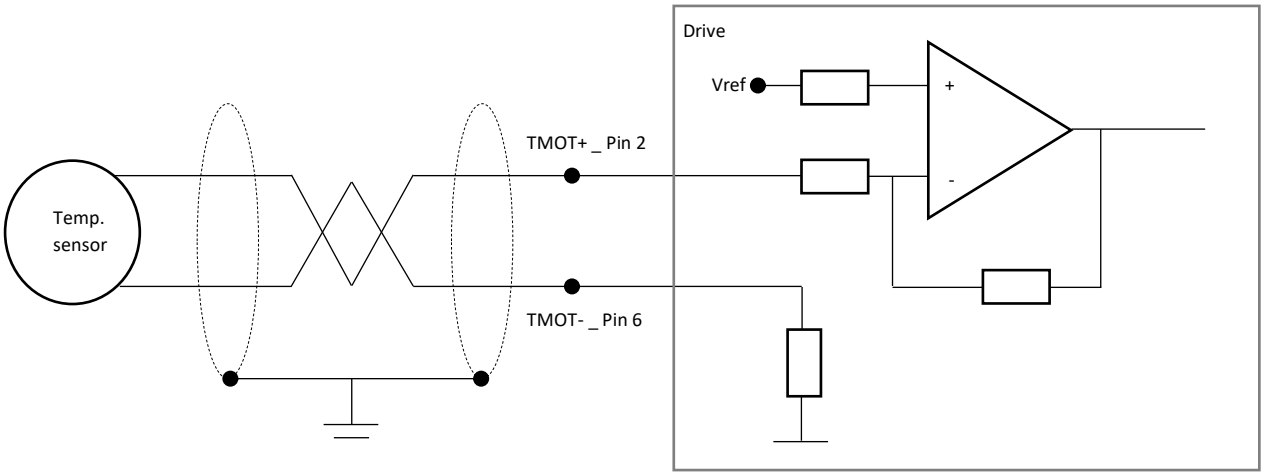
4. XENC2 – Encoder Feedback 2 – Sub DB-9M

Counter connector	Pin	I/O	Name	Meaning
Sub DB-9F 	1	I	AIN2	Differential Digital Input-Channel A2-TTL(2) (3)
	2	I	BIN2	Differential Digital Input-Channel B2-TTL(2) (3)
	3	I	ZIN2	Differential Digital Input-Channel Z2-TTL(2) (3)
	4	NA	NC	Not connected
	5	I/O	V5_FB	5 VDC supply voltage, limited to 100 mA (1)
	6	I	AINB2	Differential Digital Input-Channel A2-TTL(2) (3)
	7	I	BINB2	Differential Digital Input-Channel B2-TTL(2) (3)
	8	I	ZINB2	Differential Digital Input-Channel Z2-TTL(2) (3)
	9	I/O	GND	Ground

(1) Referenced to GND, (2) Prefer the use of shielded twisted pair cable for noise immunity.

5. Interface details

a. Motor temperature input on XENC1 - TMOT- / TMOT+



This input is used to monitor the motor temperature, it supports various resistive (NTC/PTC) temperature sensor such as KTY and PT. It can also be left un-connected or be used with thermo switch.

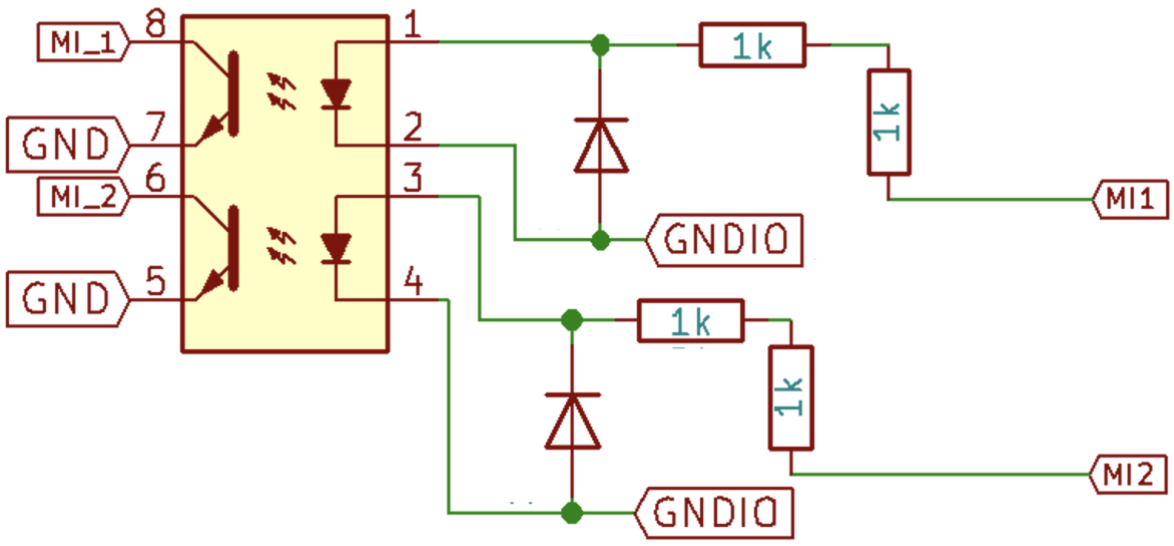
Sensor parameters are set through the ADM software.

Prefer shielded twisted pair wiring for noise immunity

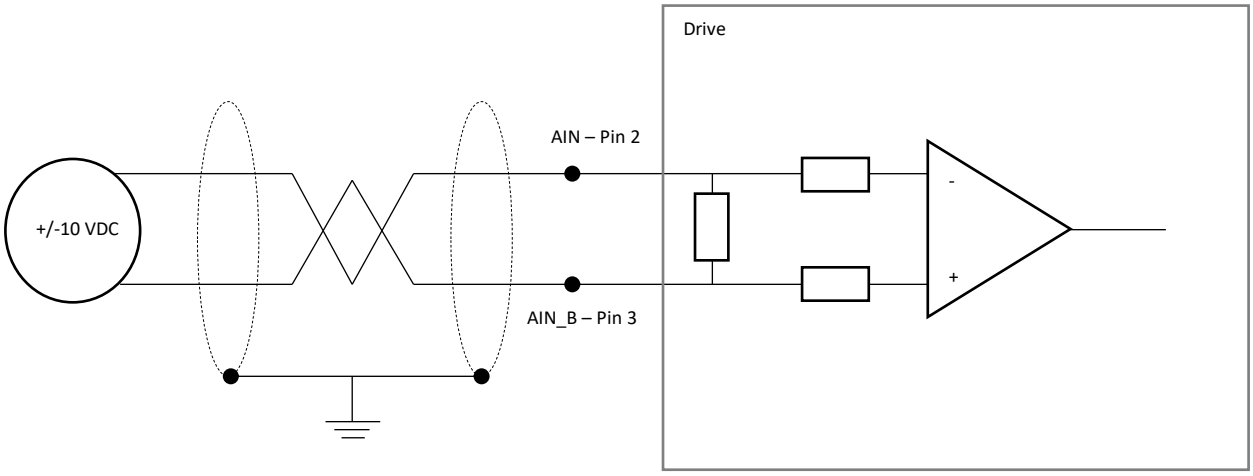
b. Isolated digital inputs on XIO – ENABLE 1/ENABLE2_MI0/MI1/MI2/MI3/MI4

Digital inputs meaning & function can be defined through the ADM software.

All inputs are Isolated and referenced to GNDIO, they must be supplied with 5 to 24 VDC to be activated.



c. Analog input on XIO – AIN / AIN_B



Voltage interface for input voltage range +/-10V.

This analog signal can be used to control speed or current applied to the motor and is configurable by the ADM software.

Prefer shielded twisted pair wiring for noise immunity.

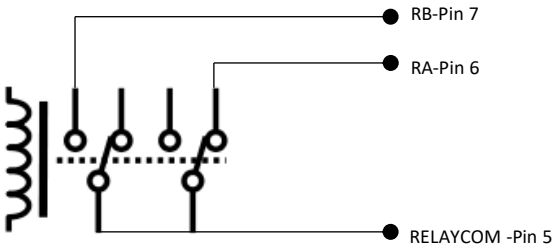
Fully differential input, polarity can be physically reverted to inverse the command.

d. Output Relay on XIO – RA / RC

The output relay function is configurable thought the user software to commute when the below event occurs:

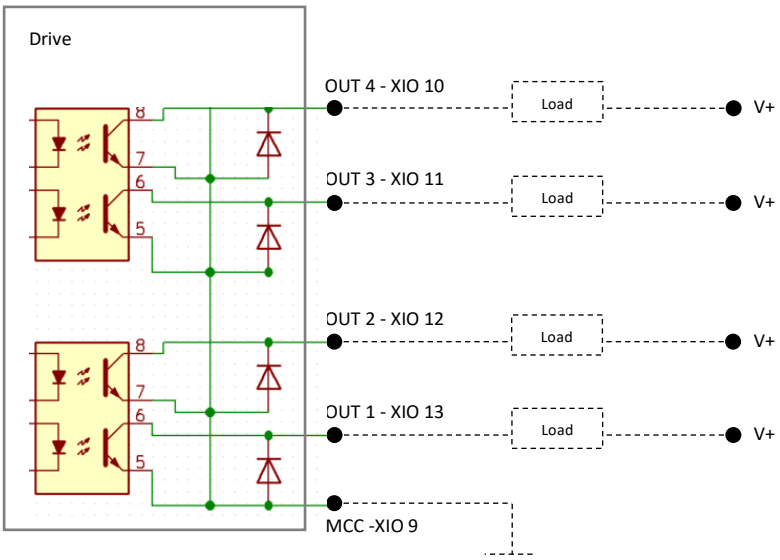
- Alarm
- Warning
- Drive operational
- Speed reached
- Non-zero speed

The absolute maximum rating of the relay contacts is 0.5A under 125VAC or 2A under 30VDC.



Relay output function can be defined through the ADM software, default setting is error state.

e. Digital outputs on XIO



Isolated low side driver

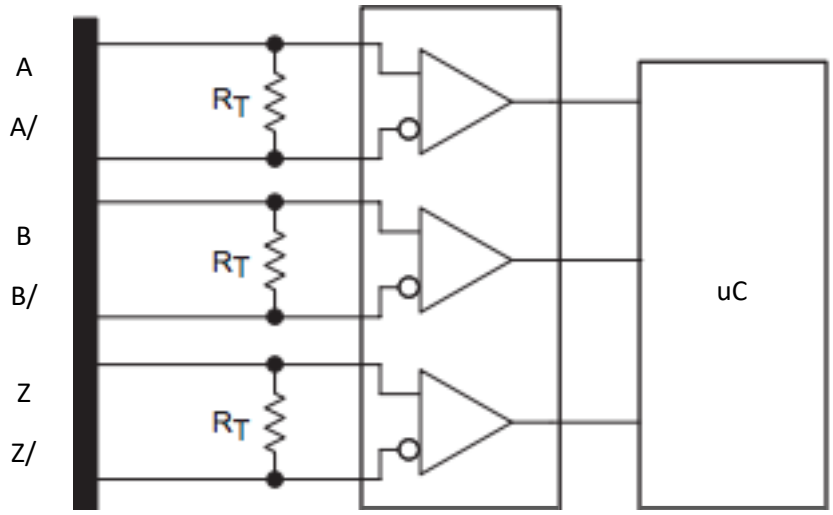
- Max 50 mA per channel
- Max 75 VDC
- Protected against wrong polarity
- Digital output meaning & function can be defined through the ADM software

f. Encoder input on XENC1 and XENC2

The encoder interface of XENC1 is compatible with incremental encoders with differential input in TTL or Sin/cos 1 Vpp, the input type need to be selected in the ADM software.

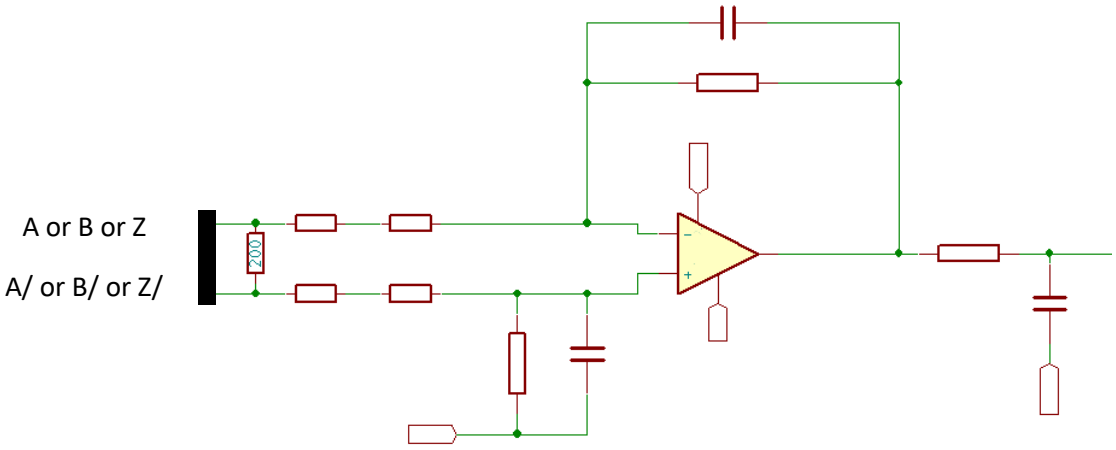
The encoder interface of XENC2 is compatible with incremental encoders with differential input in TTL only.

TTL differential encoder input:



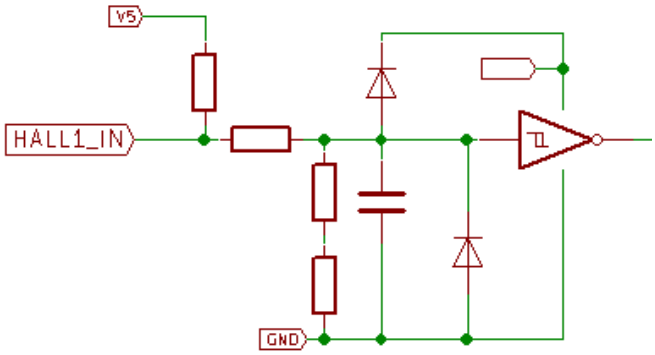
R_T = 200 Ohms

1Vpp differential encoder input (per channel) on XENC1:



g. Hall sensor inputs on XENC1

Hall sensor inputs are compatible with 5V TTL inputs.



XI. Start truth table with default settings

	Input	Function	State			
Control mode configuration	XIO 1 - MI_1	Internal set point selection	0	1	0	1
	XIO 1 - MI_2	External control selection	0	0	1	1
Control inputs	XIO 1 - ENA_1	Enable drive	1	1	1	1
	XIO 1 - ENA_2	Start/Stop	NC	NC	1	1
	HMI - Start stop button	Start/stop	1	1	NC	NC
	HMI - RPM slider	Speed control	NC	Set RPM	NC	Set RPM
	XIO 1 - Analog input	Speed control	Set RPM	NC	Set RPM	NC

1 = Activated, NC = State not considered.

Note: The control mode configuration is only considered at start-up or drive reset, changes made to the configuration require a drive reboot or a drive reset to be effective.

XII. Error/Warning List – Troubleshooting guide

Error / Warning message	Description	Possible action(s)
ERROR - Over PWM	Maximum PWM duty cycle overpassed, the drive pulse width overpassed it's maximum.	Reset drive or power cycle
ERROR - Current Max	The maximum courant was overpassed	Reset drive or power cycle
ERROR - Current Max non reset	The maximum courant overpassed error is not reset	Reset drive or power cycle
ERROR - DC Bus	The internal DC Bus is not present	The drive might only be powered by it's auxilary power supply or via USB, verify the main input voltage presence
ERROR - AC Input	AC Input not detected	Verify AC main supply
ERROR - Temp. Motor	The motor temperature have exceed the set limit	Let motor cool down, verify the load condition, verify electrical integrity. Reset drive or power cycle
ERROR - Temp. Drive	The drive temperature have exceed the set limit	Let the drive cool down, verify that sufficient ventilation is present. Reset drive or power cycle
ERROR - External Fault	An external fault was triggered on the drive logical entry	Reset drive or power cycle
ERROR - Motor Fault	The motor present a faulty condition	Verify electrical integrity. Reset drive or power cycle
ERROR - CMD not exec.	Command not executed	Internal drive fault, reset drive or power cycle
ERROR - STO active	The Safe Torque Off function is active meaning that the STO's entries are not powered.	Clear fault condition
ERROR - FPGA not Prog.	FPGA is not programmed	Internal drive fault, reset drive or power cycle
ERROR - I2T protection	The I2T protection occured, the current integrated in time have overpassed the set limit.	Reduce of verify the motor load condition, verify electrical integrity. Reset drive or power cycle
ERROR - Volt. Param not set	The internal DC bus is too low compare to the requested level	The drive might only be powered by it's auxilary power supply or via USB, verify the main input voltage presence
ERROR - Soft-Hard not comp.	Hardware and software are not compatible.	Download compatible software to the drive, reset drive or power cycle
ERROR - No Resolver	Resolver not detected while the parameter set is calling for it	Verify the resolver connection
ERROR - No Encoder	Encoder not detected while the parameter set is calling for it	Verify the encoder connection
ERROR - Sensorless stall	The motor has stalled in sensorless mode	Verify motor load and motor integrity, Reset drive or power cycle, restart motor.
ERROR - Hardware problem	Hardware fault detected	Internal drive fault, reset drive or power cycle
ERROR - Main IRQ too long	Internal dirve fault	Internal drive fault, reset drive or power cycle
ERROR - STO during enable	The Safe Torque Off function is active meaning that the STO's entries are not powered.	Clear fault condition, reset alarm.
ERROR - Corrupted Param.	Corrupted parameters	Internal drive fault, reload parameters, save, reset drive or power cycle
ERROR - Mot. Air sup. too low	The Motor Air Supply (MAS) is detected to low compared to the set threshold	Verify the motor air supply condition, clear fault condition

ERROR - Over power BUS	An over power on the internal DC bus have been detected	Reduce of verify the motor load condition, verify electrical integrity. Reset drive or power cycle
ERROR - Auto param. No code.	No code is read for the auto parameter detection, while the option is active. "0" is read.	Verify the motor connections. Verify parameter coding value in the connectors.
ERROR - No param for auto dtc.	The parameter set detected by the motor auto detection does not have a matching reference in memory	Verify the motor connections. Verify that you plugged a motor for whch there is a parameter set loaded.
ERROR - Auto param. Mismatch	Their is a mismatch between the currently loaded parameter an the one detected on the motor connector.	If a motor change did occur, a drive reset in mandatory to load the new parameters. If not, verify the motor connection.
WARNING - Over PWM	Maximum PWM duty cycle reached, the drive pulse width is at it's maximum, current is limitted by the couple motor/drive.	Warning state
WARNING - Mot. Temp.	The motor temperature have reach the set warning limit	Warning state. If the motor temperature keeps on rising, the error will occur
WARNING - Drive Temp.	The drive temperature have reach the set warning limit	Warning state. If the drive temperature keeps on rising, the error will occur
WARNING - Main IRQ too long	Internal dirve warning	Warning state
WARNING - Volt. not in param. WARNING - DC Bus not in range	The internal DC bus is too different compare to the requested parameter level	Warning state. The internal DC bus may have change or the choosen parameter set is not adapted to the DC bus voltage level
WARNING - Resolver sat.	The resolver input is saturated	Verify the resolver connection, adapt the amplitude compensation parameter
WARNING - Limit switch active	One of the limit switch is activated, forbiding the motor rotation in one direction.	Remove warning condition
WARNING - I2T Drive	The I2T protection is at warning level, the current integrated in time have overpassed the set limit.	Reduce of verify the motor load condition, verify electrical integrity
WARNING - I2T Motor	The I2T protection is at warning level, the current integrated in time have overpassed the set limit.	Reduce of verify the motor load condition, verify electrical integrity
WARNING - Eth. link no connect	Ethernet link is not connected	Verify the connection parameters and the physical ethernet connection

XIII. ADM – Drive Manager Software

The ADM functionalities are described in another manual, please contact us for details.