eliwell
by Schneider Electric

XVD

Driver for bipolar electronic expansion valve

USER MANUAL

9MA10254.02

www.eliwell.com

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof.
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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed. Failure to use Eliwell software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

CONTENTS

SAFETY INFORMATION

Important information

Read these instructions carefully and visually inspect the equipment to familiarise yourself with the device before attempting to install it, put it into operation, overhaul or service it.
The following warning messages may appear anywhere in this documentation or on the equipment to warn of potential dangers or to call attention to information that can clarify or simplify a procedure.

The addition of this symbol to a danger warning label indicates the existence of an electrical danger that could result in personal injury should the user fail to follow the instructions.

This is the safety warning symbol.
It is used to warn the user of the potential dangers of personal injury. Observe all the safety warnings that follow this symbol to avoid the risk of serious injury or death.

⚠ DANGER

DANGER indicates a dangerous situation that, unless avoided, **will result in** death or cause serious injuries.

⚠ WARNING

WARNING indicates a potentially dangerous situation which, if not avoided, **could result** in death or serious injury.

⚠ CAUTION

CAUTION indicates a dangerous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE used in reference to procedures not associated with physical injuries.

NOTE

Electrical equipment must be installed, used and repaired by qualified personnel only.
Neither Eliwell nor Schneider Electric accepts responsibility for any consequences resulting from the use of this material. A qualified person is someone who has specific skills and knowledge regarding the structure and the operation of electrical equipment and who has received safety training on how to avoid the inherent dangers.

Permitted use

This product is used to control unipolar and bipolar stepper electronic expansion valves.

The device must be installed and used in accordance with the instructions provided. In particular, parts carrying dangerous voltages must not be accessible under normal conditions.

It must be adequately protected from water and dust with regard to the application, and must only be accessible using a keyed or tooled locking mechanism (with the exception of the front panel).

The device is suitable for use in household refrigeration appliances and/or similar equipment and has been tested in accordance with the harmonized European reference standards.

Prohibited use

Any use other than that expressly permitted is prohibited.

The relay contacts provided are mechanical and subject to failure; any protection devices required by product standards, or suggested by good practice in view of obvious safety requirements, must be installed externally of the device.

Liability and residual risks

The liability of Eliwell Controls srl and Schneider Electric are limited to the correct and professional use of the product according to the directives referred to herein and in the other supporting documents, and does not cover any damage (including but not limited to) the following causes:

- unspecified installation/use and, in particular, in contravention of the safety requirements of the legislation in force in the Country of installation and/or specified in this document;
- Use on equipment which does not provide adequate protection against electrocution, water and dust in the actual installation conditions;
- use on equipment allowing access to dangerous parts without having to use a keyed or tooled locking mechanism to access the equipment;
- tampering with and/or modification of the product;
- installation/use on equipment that does not comply with the regulations in force in the Country of installation.

Disposal

The equipment (or product) must be subjected to separate waste collection in compliance with the local legislation on waste disposal.

Date of production

The date of production is shown on the device label, indicating the week and year of production (WW-YY).

Product related information

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH OR FIRE

- Disconnect all power from all equipment including connected devices, prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires except under the specific conditions specified in the appropriate hardware guide for this equipment.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Replace and secure all covers, accessories, hardware, cables and wires.
- Verify the earthing connections on all earthed devices.
- Use this equipment and all connected products only at the specified voltage.

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

⚠ WARNING

LOSS OF CONTROL

- The installation designer must consider the potential failure modes of the control circuit and, for some critical control functions, provide a means for reaching a safe condition during and after a circuit failure. Examples of critical control functions are the emergency stop and end of travel stop, power supply cut-off and restarting.
- Separate or redundant control circuits must be provided for critical control functions.
- The system control circuits can include communication connections. Keep in mind the implications of transmission delays or sudden connection failures.
- Comply with all the standards regarding accident protection and the local applicable safety directives ([1]).
- Every implementation of this device must be tested individually and completely in order to verify its proper operation before putting it in service.

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

([1]) For additional information, refer to the standards NEMA ICS 1.1 (latest edition), “Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control” and NEMA ICS 7.1 (latest edition) “Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems” or to equivalent standards that regulate your particular location.

Flammable gas refrigerant

The use of flammable gas refrigerants is dependent on may factors, including local, regional and/or national regulations.

The *controller*, *valve*, *sensor*, *accessory* described in the present document incorporate components, and specifically electromechanical relays, which have been tested to IEC 60079-15, and are classified as nC components (non-sparking 'n' electrical apparatus).

Conformance to IEC 60079-15 is considered sufficient, and thereby suitable, for commercial refrigeration and HVAC applications applying flammable gas refrigerants, such as R290. However, other limitations, equipment, locations and/or type of machine (refrigerators, vending machines and dispensers, bottle coolers, ice machines, Reach-Ins, etc.) may also be implicated, restricted and/or required in so doing.

The use and application of the information contained herein require expertise in the design and parameterizing/programming of HVAC and refrigeration control systems. Only you—the original equipment manufacturer, installer or user—can be aware of all the conditions and factors present, and the regulations applicable, during the design, installation and setup, operation, and maintenance of the machine or related processes. Therefore, only you can determine the suitability of automation and associated equipment, and the related safeties and interlocks, which can be effectively and properly used in the locations for which the equipment is to be put into service. When selecting automation and control equipment, and any other related equipment or software for an application, you must also consider any applicable local, regional or national standards and/or regulations.

You must verify, while incorporating this controller and related equipment, the final compliance of the machine to regulations and standards when using flammable gas refrigerants. Although all statements and information contained herein are believed to be accurate and reliable, they are presented without warranty of any kind. Information provided herein does not relieve you from the responsibility of carrying out your own tests and validations of conformance to any applicable regulations.

⚠ WARNING

REGULATORY INCOMPATIBILITY

Be sure that all equipment applied and systems designed comply with all applicable local, regional and national regulations and standards.

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

ABOUT THE BOOK

Document scope

This document describes **XVD** devices with unipolar and bipolar (EEV) electronic expansion valve, including information on installation and wiring.

Use this document to:
- Install and use your **XVD** device
- Become familiar with the functions of the **XVD** device

NOTE: Read this document and all related documents carefully before installing, operating or maintaining the device.

Note regarding validity

This document is valid for devices **XVD** (MSK 589).
The technical characteristics of the devices described in this manual can also be consulted on-line on the Eliwell website. The characteristics illustrated in this manual should be identical to those which can be consulted on-line. In line with our policy of continuous improvement, we may revise the contents to improve clarity and accuracy. If you note any discrepancies between the manual and the information consulted on-line, please use the latter as a reference.

Related documents

Document type	Reference document code	Document title
User Manual	9MA00229 9MAA0229	9MA00229 MAN XVD IT 9MAA0229 MAN XVD RU
Instruction Sheet	9IS54596	9IS54596 IS XVD 10L (EN-IT-FR-DE-ES-PT-TR-ZH-RU-KK)

You can download these technical publications and other technical information from our website at:

www.eliwell.com

CHAPTER 1
INTRODUCTION

1.1. DESCRIPTION

XVD is the compact solution of the Eliwell platform of drivers managing bipolar step-by-step electronic expansion motor valves suited for a range of needs in the HVAC/R market and beyond.

The possibility to select refrigerant types and compatibility with most commercially available valves make **XVD** a particularly versatile module.

XVD also offers the possibility to configure a refrigerant that is not included in the factory default settings.

The valve controlled by driven motor under current and the independent operation for hot and cold by means of double regulator mapping improves performance.

XVD in fact ensures a very precise, stable and reliable control of the refrigerant flow, consequently increasing efficiency and energy savings by adjusting the overheating and opening the valve according to the performance demanded by the system and in different working conditions.

Reliability is guaranteed by the isolated serial connections and backup sensors.

XVD is available in various models, which can be used as single actuators or in “stand-alone” mode (via Digital inputs or RS-485 serial port). The models are available mounted on a DIN rail which saves time in terms of wiring.

An SKP 10 terminal is used to configure the parameters and operations to carry out on the device, to be connected to the LAN serial port inside the door.

XVD also has the same Modbus RTU serial communication standard interface and the option of downloading parameter maps and applications via the Multi Function Key.

Ratiometric pressure sensors and SKP 10 terminals can also be connected with no need for any further serial interfaces.

All digital inputs and digital outputs are independent and configurable, meaning they can be adapted to fit any system.

Power supply is 24 Vac /24 Vdc.

MAIN FUNCTIONS

The main functions of the **XVD** are as follows:

- Refrigerant selected via selectors (DIP switches) under the door;
- Backup probes control saturation and evaporator output (overheating);
- Valve state shown via LEDs;
- Parameter settings via keyboard or PC;
- Multi Function Key (MFK) to download or upload parameter maps and applications;
- DeviceManager software for rapid parameter programming;
- Terminal (up to 10 m - 32.8 ft) that can be connected directly with no serial interface;
- Configurable inputs NTC, Pt1000, 4...20 mA, 0-10 V, 0-5 V ratiometric;
- 2 Digital inputs to control valve and/or alarm

In this manual, the photographs and drawings help to demonstrate the **XVD** device (and other Eliwell devices) and are purely illustrative. The relative dimensions and proportions may not correspond to the actual dimensions, nor are actual size or in scale. Moreover, all wiring and electrical diagrams are to be considered as simplified representations which do not correspond to the actual situation.

1.2. RANGE

MODELS

Code	Model	AI	DI	DO	OC	RS-485	LAN	Power supply
XVD100H000030	XVD 100H ACTUATOR STEP 24V-V3	1	0	1	0	NO	NO	24 Vac/dc
XVD420H000030	XVD 420H DIGITAL STEP 24V-V3	4	2	1	1	NO	NO	24 Vac/dc
XVD420H485030	XVD 420H RS-485 STEP 24V-V3	4	2	1	1	YES	NO	24 Vac/dc
XVD420HLAN030	XVD 420H LAN STEP 24V-V3	4	2	1	1	NO	YES	24 Vac/dc

Key: **AI** = Non-dangerous voltage analogue inputs; **DI** = voltage-free digital inputs;
DO = High voltage digital outputs; **OC** = Open Collector Digital outputs;
RS-485 = integrated RS485 serial; **LAN** = integrated LAN serial

TERMINAL

Code	Description	Installation	Dimensions	Display	Power supply
SKP1000000000	SKP 10	Panel	74x32x30 mm 2.91x1.26x1.18 in.	LED / 4 digit	From **XVD** driver

NOTE: *SKP 10 Terminal not supplied. Available to order separately.*

LIST OF COMPATIBLE/PILOTABLE VALVES

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Verify the valve parameters declared by the manufacturer before using the valve as a generic valve.

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

Driver **XVD** is compatible with the **COMPATIBLE** valves listed below:

Model	Power supply	Notes
ELIWELL by Schneider Electric - SXVB261●●●●●● (Body 1)	24 Vdc	Bipolar
ELIWELL by Schneider Electric - SXVB262●●●●●● (Body 2)	24 Vdc	Bipolar
ELIWELL by Schneider Electric - SXVB263●●●●●● (Body 3)	24 Vdc	Bipolar
ELIWELL by Schneider Electric - SXVB264●●●●●● (Body 4)	24 Vdc	Bipolar

Driver **XVD** is compatible with the **PILOTABLE** valves listed below:

Model	Power supply	Notes
SPORLAN SER(I) B, C, D, G, J, K	12 Vdc	Bipolar
SPORLAN SER 1,5 TO 20	12 Vdc	Bipolar
SPORLAN SEI-30	12 Vdc	Bipolar
SPORLAN SEI-50 SEH	12 Vdc	Bipolar
DANFOSS ETS 50	12 Vdc	Bipolar
DANFOSS ETS 100	12 Vdc	Bipolar
ALCO EX4/EX5/EX6	24 Vdc	Bipolar
ALCO EX7	24 Vdc	Bipolar
ALCO EX8	24 Vdc	Bipolar

NOTE: if using with other valves which are not listed, contact Eliwell Technical Support

Eliwell Controls Srl is not liable for the data provided by the valve manufacturer, including any technical modifications or updates. Consult the product manual and the valve manual to verify the suitability and correct configuration.

For more information see **'3.4. VALVE CONNECTION' on page 37**.

1.3. ACCESSORIES

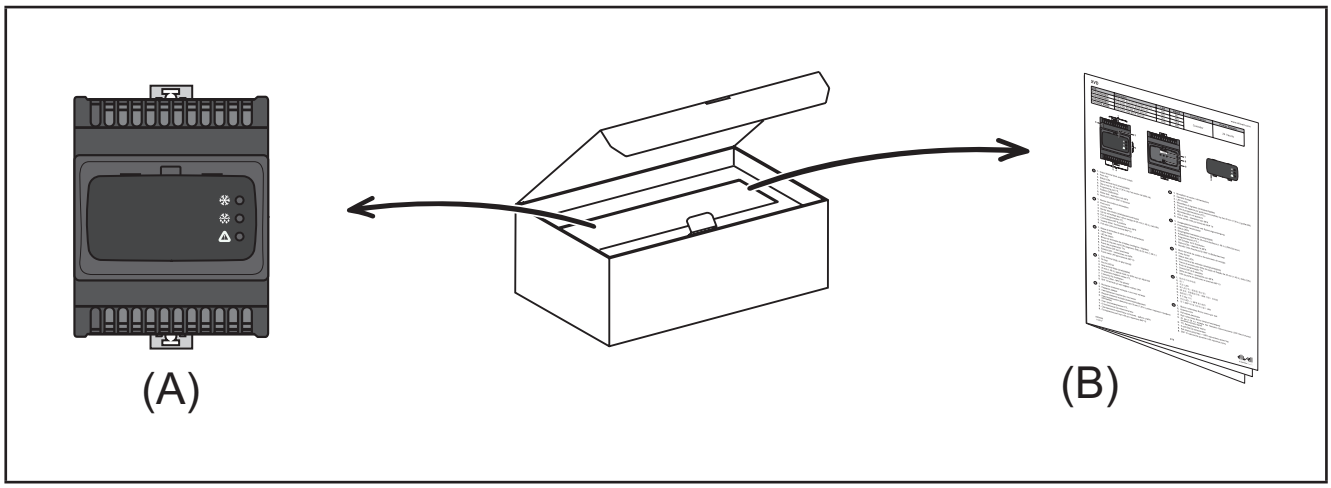
Depending on your own applications, the following accessories may be purchased separately:

Image	Description
	SKP 10 terminal
	TRANSFORMER
	MULTI FUNCTION KEY (MFK)
	NTC “FAST”
	RATIOMETRIC TRANSDUCERS (EWPA)
	PRESSURE TRANSDUCERS (EWPA)
	DEVICE MANAGER INTERFACE (DMI)
	Connections: • BUSADAPTER • RADIOADAPTER • WEBADAPTER • WEBADAPTER Wi-Fi
	DEVICE MANAGER
	DEMO CASE

NOTE: Contact Eliwell Sales Office for item codes.

1.4. CONTENTS OF PACK

The figure below shows the contents of the package of an **XVD** device.



The following can be found in the package:

Label	Description
A	**XVD** device
B	Instruction Sheet **XVD**

CHAPTER 2
MECHANICAL INSTALLATION

2.1. BEFORE STARTING

Before installing your system, read this chapter carefully.

Only the user, the machine manufacturer or the integrator can be familiar with all the conditions and factors present during installation and set up, preparing, starting-up and servicing the machine the process and therefore only they are able to determine which automation equipment and relative safety devices and interlocks can be used in a correct and efficient manner.

When the automation and control equipment and any other relative equipment or software are selected for a particular application, the applicable local, regional and national standards and regulations must also be taken into consideration.

Caution must be used concerning compliance with all safety information, other electrical requirements or laws which may apply to your machine or process when using this device.

⚠ WARNING

REGULATORY INCOMPATIBILITY

Ensure that all equipment used and the systems designed comply with all applicable local, regional and national laws.

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

2.2. DISCONNECTING THE POWER SUPPLY

Assemble and install all options before installing the control system on an assembly rail, the panel door or other assembly surface. Before dismantling the equipment, remove the control systems from the assembly rail, plate or panel.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH OR FIRE

- Disconnect all power from all equipment including connected devices, prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires except under the specific conditions specified in the appropriate hardware guide for this equipment.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Replace and secure all covers, accessories, hardware, cables and wires.
- Verify the earthing connections on all earthed devices.
- Use this equipment and all connected products only at the specified voltage.

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

2.3. OPERATING ENVIRONMENT

The use of flammable gas refrigerants is dependent on may factors, including local, regional and/or national regulations.

The *controller*, *valve*, *sensor*, *accessory* described in the present document incorporate components, and specifically electromechanical relays, which have been tested to IEC 60079-15, and are classified as nC components (non-sparking 'n' electrical apparatus).

Conformance to IEC 60079-15 is considered sufficient, and thereby suitable, for commercial refrigeration and HVAC applications applying flammable gas refrigerants, such as R290. However, other limitations, equipment, locations and/or type of machine (refrigerators, vending machines and dispensers, bottle coolers, ice machines, Reach-Ins, etc.) may also be implicated, restricted and/or required in so doing.

The use and application of the information contained herein require expertise in the design and parameterizing/ programming of HVAC and refrigeration control systems. Only you—the original equipment manufacturer, installer or user—can be aware of all the conditions and factors present, and the regulations applicable, during the design, installation and setup, operation, and maintenance of the machine or related processes. Therefore, only you can determine the suitability of automation and associated equipment, and the related safeties and interlocks, which can be effectively and properly used in the locations for which the equipment is to be put into service. When selecting automation and control equipment, and any other related equipment or software for an application, you must also consider any applicable local, regional or national standards and/or regulations.

You must verify, while incorporating this controller and related equipment, the final compliance of the machine to regulations and standards when using flammable gas refrigerants. Although all statements and information contained herein are believed to be accurate and reliable, they are presented without warranty of any kind. Information provided herein does not relieve you from the responsibility of carrying out your own tests and validations of conformance to any applicable regulations.

⚠ WARNING

REGULATORY INCOMPATIBILITY

Be sure that all equipment applied and systems designed comply with all applicable local, regional and national regulations and standards.

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

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Install and use the device in compliance with the conditions described in the chapter "Technical Data" of the present document.

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

2.4. COMMENTS CONCERNING INSTALLATION

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Install and operate this equipment in an enclosure appropriately rated for its intended environment and secured by a keyed or tooled locking mechanism.
- Power line and output circuits must be wired and fused in compliance with local and national regulatory requirements for the rated current and voltage of the particular equipment.
- Do not use this equipment in safety-critical machine functions unless the equipment is otherwise designated as functional safety equipment and conforming to applicable regulations and standards.
- Do not disassemble, repair, or modify this equipment, unless otherwise expressly indicated.
- Do not connect wires to unused terminals and/or terminals indicated as “No Connection (NC)”.

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

For mechanical dimensions, see **‘4.2. MECHANICAL CHARACTERISTICS’ on page 39**.

XVD devices are designed for assembly on DIN rail.

2.5. XVD INSTALLATION

For installation proceed as follows:

1. Move the two locking clips outwards (lever with a screwdriver in the compartments)
2. Mount the device on the DIN rail
3. Press the clips inwards to lock.

   NOTE: Once assembled on the DIN RAIL, verify that the spring docking devices are turned downwards.

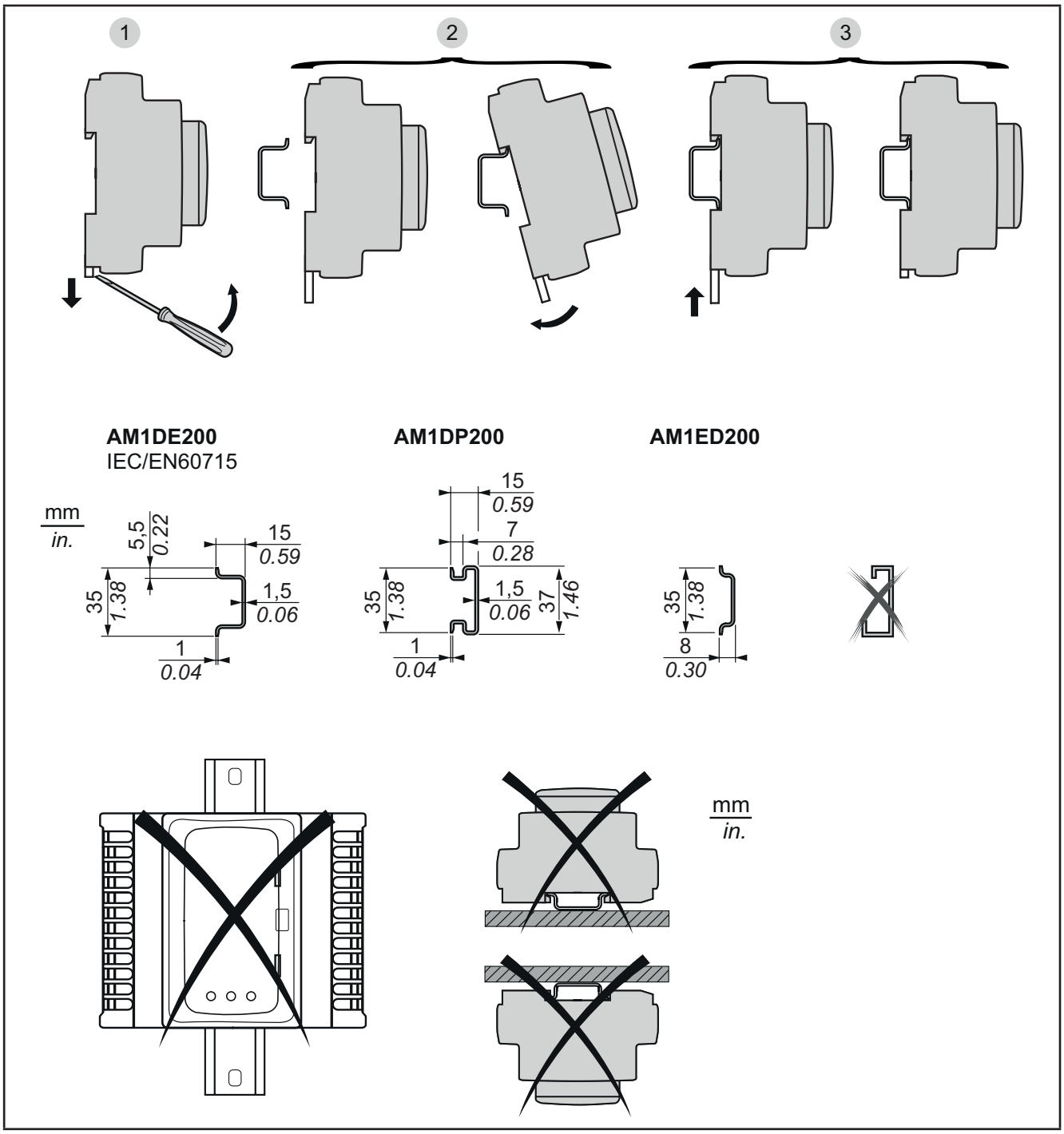


Fig. 1. Installation

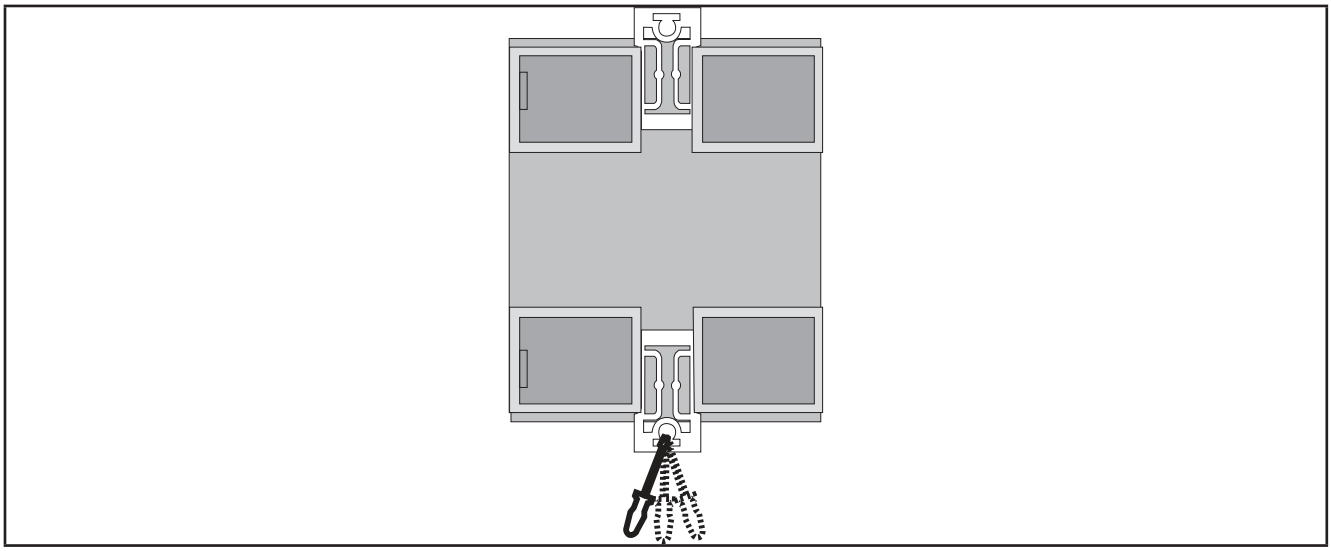


Fig. 2. Detail of sping hooking devices

The **XVD** device was designed as an IP20 classification product and must only be installed in type-approved cabinets and/or in points that block access to unauthorised persons.

When installing the device, comply with a series of distances:

- Between **XVD** and all sides of the cabinet (including the panel door).
- The terminal boards on the **XVD** and the wiring cable trays. These distances reduce the electromagnetic interference between the device and the wiring cable trays.
- The **XVD** and the other heat-generating devices installed in the same cabinet.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Place the devices dissipating the most heat in the top of the cabinet and ensure suitable ventilation.
- Do not place this equipment near or above any devices which could cause overheating.
- Install the device in a point that guarantees the minimum distances from all structures and adjacent equipment as indicated in this document.
- Install all equipment in conformity with the technical specifications given in the respective documentation

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

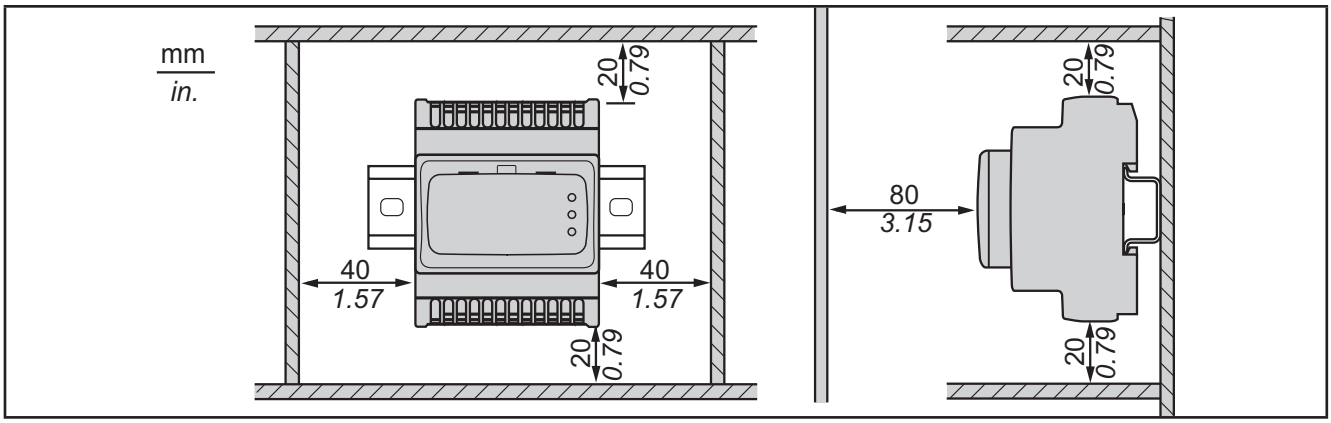


Fig. 3. Distances

2.6. ACCESS TO DIP SWITCHES

When handling the equipment, use caution to avoid damage caused by electrostatic discharge.
In particular, the unshielded connectors and in certain cases the open circuit boards are vulnerable to electrostatic discharge.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION DUE TO ELECTROSTATIC DISCHARGE

- Store the equipment in the protective packaging until ready for installation.
- The device must only be installed in type-approved cabinets and/or in points that prevent unauthorised access and provide protection from electrostatic discharge as defined in IEC 1000-4-2.
- When handling sensitive equipment, use an earthed protective device against electrostatic discharge
- Before handling the device, always discharge the static electricity from the body by touching an earthed surface or type-approved antistatic mat.

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

For access to the DIP switches proceed as follows:

1. Use a straight-edge screwdriver or the nail of your index finger to remove the panel.
2. Carefully configure the selectors (DIP switches) or connect the **SKP 10** terminal;
3. Close the front of the keyboard by pressing with your fingers.

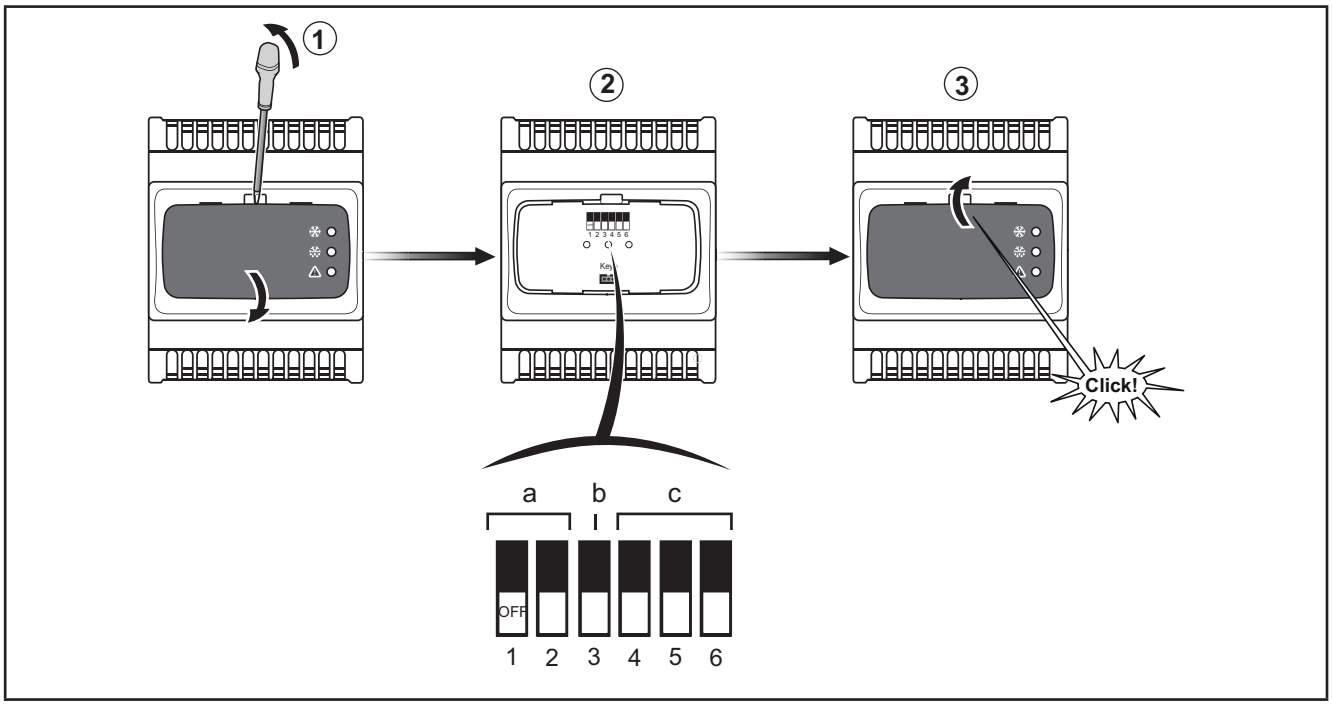


Fig. 4. DIP Switch

The DIP Switches are used to set the following:

a. (DIP 1-2) Used to activate the upload or download of parameters from the MFK
b. (DIP 3) Used to select the network address
c. (DIP 4-5-6) Allows the user to choose the refrigerant used

2.7. SKP 10 INSTALLATION

The **SKP 10** terminal is designed for panel mounting (on a flat surface) using the brackets provided.
For installation proceed as follows:

1. Make a 71x29 mm hole (2.80x1.14 in.).
2. Insert the keyboard.
3. Fix the brackets in the guides on the 2 sides of the keyboard to lock into place (you should hear a “Click”).
4. To remove press the brackets on the 2 sides of the device (“Click”), remove them and push the keyboard.
5. Remove the keyboard.

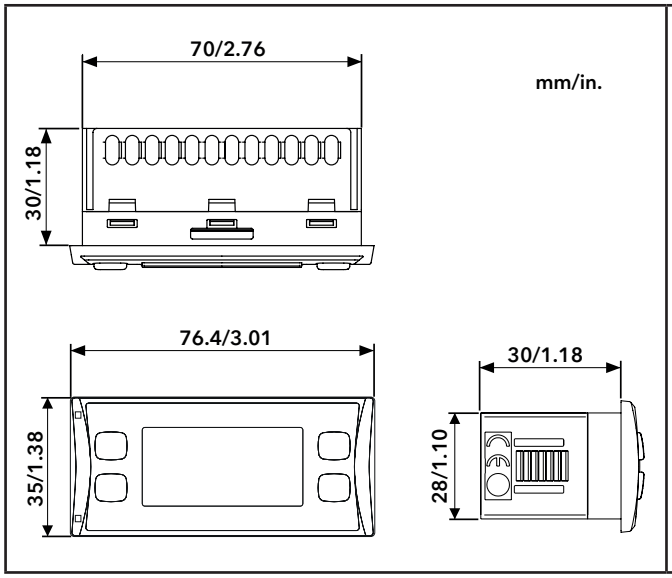


Fig. 5. Dimensions

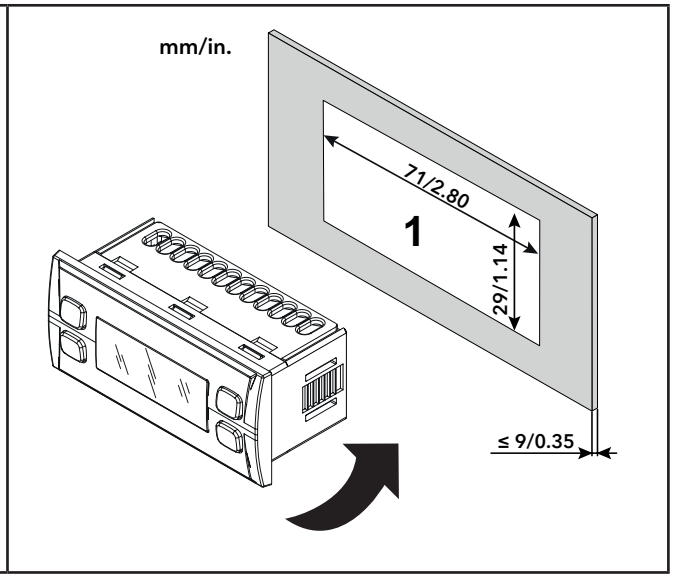


Fig. 6. Panel mounting

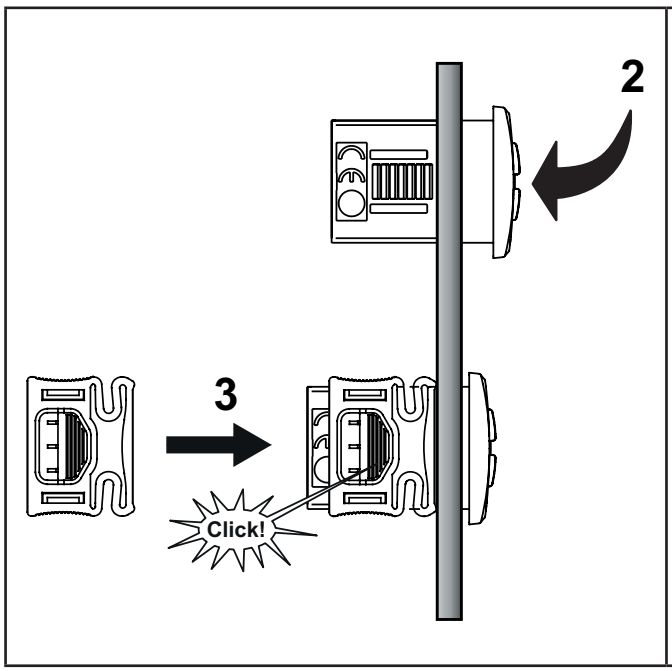


Fig. 7. Example of insertion

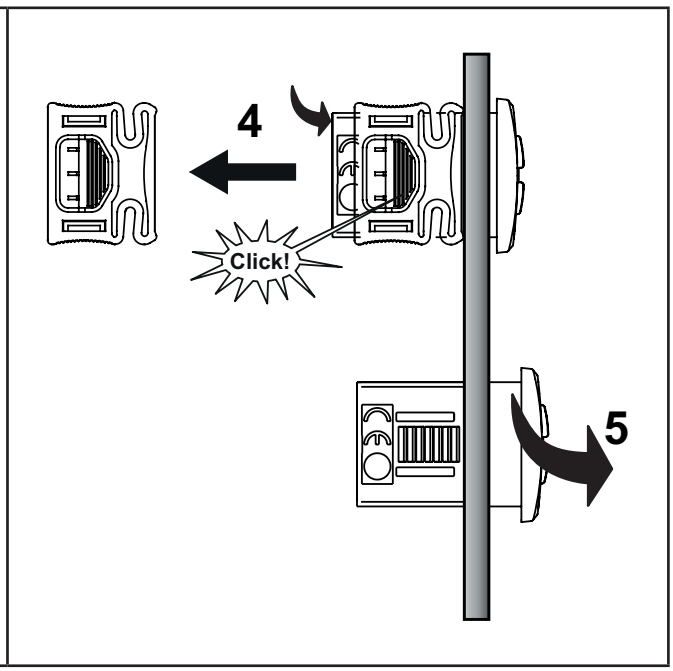


Fig. 8. Example of removal

CHAPTER 3
ELECTRICAL CONNECTIONS

3.1. WIRING BEST PRACTICES

The following information describes the guidelines for wiring and the practices to follow when using the **XVD** device.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH OR FIRE

- Disconnect all power from all equipment including connected devices, prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires except under the specific conditions specified in the appropriate hardware guide for this equipment.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Replace and secure all covers, accessories, hardware, cables and wires.
- Verify the earthing connections on all earthed devices.
- Use this equipment and all connected products only at the specified voltage.

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

⚠ WARNING

LOSS OF CONTROL

- The installation designer must consider the potential failure modes of the control circuit and, for some critical control functions, provide a means for reaching a safe condition during and after a circuit failure. Examples of critical control functions are the emergency stop and end of travel stop, power supply cut-off and restarting.
- Separate or redundant control circuits must be provided for critical control functions.
- The system control circuits can include communication connections. Keep in mind the implications of transmission delays or sudden connection failures.
- Comply with all the standards regarding accident protection and the local applicable safety directives ([1]).
- Every implementation of this device must be tested individually and completely in order to verify its proper operation before putting it in service.

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

([1]) For additional information, refer to the standards NEMA ICS 1.1 (latest edition), “Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control” and NEMA ICS 7.1 (latest edition) “Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems” or to equivalent standards that regulate your particular location.

3.1.1. WIRING GUIDELINES

Wire the **XVD** device complying with the following rules:

- Keep the communication and I/O wiring separate from the power wiring.
  Keep these two types of cables in separate conduits.
- Verify that the operating conditions and surroundings comply with the specification values.
- Use wires of the correct diameter and suited to the voltage and current requirements.
- Use copper conductors (obligatory).
- Use twisted-pair shielded wires for analogue and/or high-speed I/Os.
- Use twisted-pair shielded wires for networks and field buses.

Use correctly earthed shielded wires for all analogue and high-speed inputs and outputs and communication connections.

If shielded wires cannot be used for these connections, the electromagnetic interference may deteriorate the signal. Deteriorated signals can result in the device, modules or attached equipment operating incorrectly.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Use shielded wires for all high-speed I/O, analogue I/O and communication signals.
- Earth the wire shields for all analogue I/O, high-speed I/O and communication signals in a single point.
- The signal cables (probes, digital inputs, communication, and relative power supplies) of the device must be routed separately from the power cables.
- Reduce the length of the wires and cables as much as possible and avoid winding them around electrically connected parts.

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

NOTE: The surface temperatures may exceed 60 °C (140 °F).
Route the mains wiring (power wires) separately from the secondary wiring (very low voltage wire coming from intermediate power sources). Where this is not possible, double insulation is required in the form of cable recesses or cable trays.

3.1.2. RULES FOR SCREW-TYPE TERMINAL BOARDS

The table below shows the type and size of cables to use for quick disconnect terminals with pitch **5.00** mm (0.197 in.).

mm / in. 7 / 0.28								
mm²	0.2…2.5	0.2…2.5	0.25…2.5	0.25…2.5	2 x 0.2…1	2 x 0.2…1.5	2 x 0.25…1	2 x 0.5...1.5
AWG	*24…13*	*24…13*	*23...13*	*23...13*	*2 x 24…17*	*2 x 24…15*	*2 x 22…17*	*2 x 20...15*

Ø 3.5 mm (*0.14 in.*)	C	N•m	0.5...0.6
		lb-in	*4.42...5.31*

Fig. 9. Pitch 5.00 mm (0.197 in.)

⚠ ⚠ DANGER

LOOSE WIRING CAN RESULT IN ELECTRIC SHOCK

Tighten the connections in compliance with the technical specifications for pairs.

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

⚠ DANGER

FIRE HAZARD

- Use only the recommended wire sections for current capacity of the I/O channels and the electrical power.
- For common relay output wiring use conductors with section of at least 2.0 mm² (AWG 14) with a nominal temperature value of at least 80 °C (176 °F).

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

3.1.3. PROTECTION OF OUTPUTS FROM DAMAGE FROM INDUCTIVE LOADS

If the device has relay outputs, these types of outputs can cope with up to 240 Vac.

Damage from inductive loads to this type of outputs can cause the contacts to weld and lead to the loss of control. Each inductive load must include a protective device such as a peak limiter or snubber. These relays do not support capacitive loads.

⚠ WARNING

RELAY OUTPUTS WELDED TO CLOSED POSITION

- Use a suitable external protective device or circuit on all relay outputs connected to alternate current (ac) inductive loads.
- Do not connect the relay outputs to capacitive loads.

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

Depending on the load a protection circuit may be required for device outputs and certain modules. Inductive load switching may create voltage impulses that damage or short circuit or reduce the life of the output devices.

⚠ CAUTION

DAMAGE TO OUTPUT CIRCUITS DUE TO INDUCTIVE LOADS

Use an external protective device or circuit able to reduce the risks caused by voltage impulses in the switching of inductive loads.

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

Choose a protection circuit from the following diagrams according to the electrical power used.
Connect the protection circuit to the outside of the device or relay output module.

Protection circuit A: this protection circuit uses a snubber and can be used for alternating current circuits. The snubber must be compatible with the type of charge and the RMS voltage of the snubber must be +10% higher than the charge voltage (for example: with a charge working at 250 Vac, the snubber must have a minimum voltage of 275 Vac).

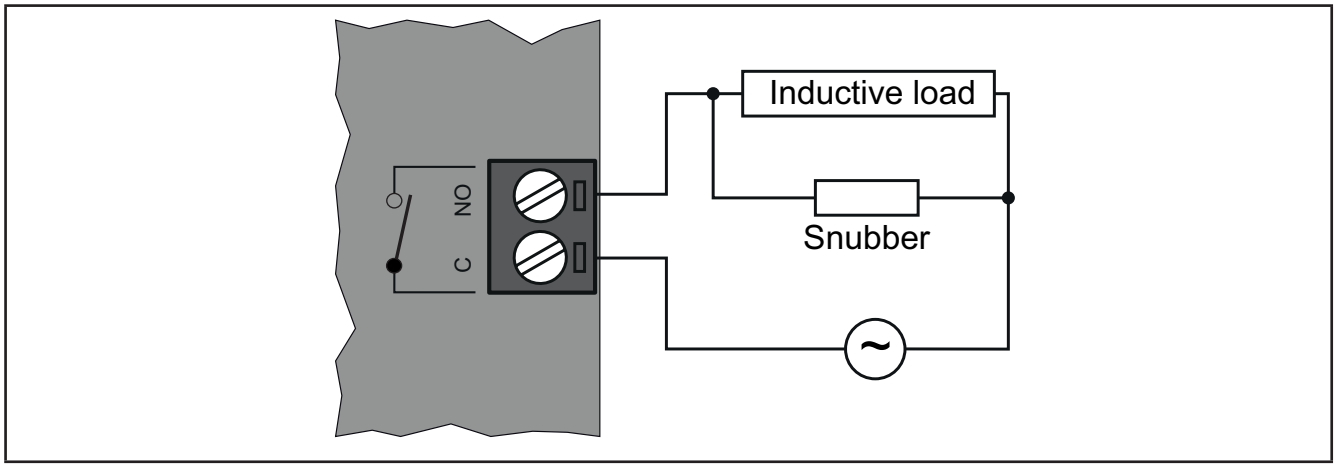


Fig. 10. Protection circuit A

Protection circuit B: this protection circuit uses a varistor and can be used for alternating current circuits. In applications in which the inductive load is frequently and/or rapidly switched on and off, verify that the maximum continuous energy (U) of the varistor is 20% or more higher than the peak load energy, and the clamping voltage on the varistor is not less than 1.6 times the charge voltage.

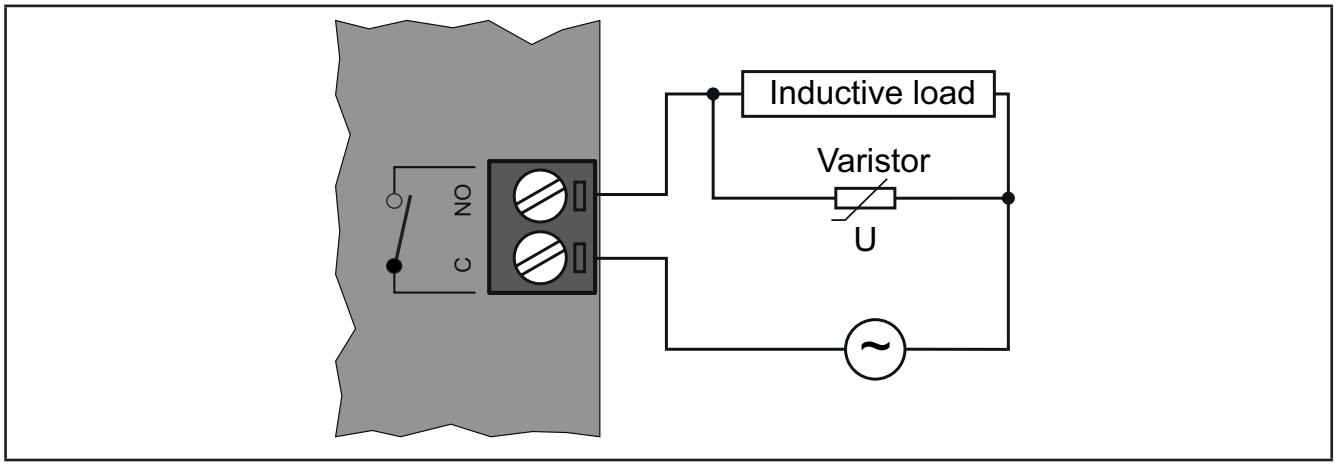


Fig. 11. Protection circuit B

NOTE: Place the protection devices as close as possible to the load.

3.1.4. SPECIFIC CONSIDERATIONS ON HANDLING

When handling the equipment, use caution to avoid damage caused by electrostatic discharge.
In particular, the unshielded connectors and in certain cases the open circuit boards are vulnerable to electrostatic discharge.

⚠ WARNING

INCORRECT OPERATION OF EQUIPMENT DUE TO ELECTROSTATIC DISCHARGE

- Store the equipment in the protective packaging until ready for installation.
- The device must only be installed in type-approved cabinets and/or in points that prevent unauthorised access and provide protection from electrostatic discharge as defined in IEC 1000-4-2.
- When handling sensitive equipment, use an earthed protective device against electrostatic discharge
- Before handling the device, always discharge the static electricity from the body by touching an earthed surface or type-approved antistatic mat.

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

Before any operations, verify that the device is connected to a suitable external power supply
(see **'4.5. POWER SUPPLY' on page 41**).

Before connecting the valve, carefully configure the device selecting the type of valve from the list of valves.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Verify the valve parameters declared by the manufacturer before using the valve in generic valve configuration.

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

Always disconnect the equipment's power supply before carrying out any maintenance on the electrical connections.

For a proper connection, stick to the following:

- Separate the cables of probes and digital inputs from inductive loads and dangerous voltage connections to prevent any electromagnetic interference. Do not place the probe cables near other electrical equipment (switches, meters, etc.).
- Make connections as short as possible and do not wind them around electrically connected parts.

3.1.5. ANALOGUE INPUTS - PROBES

The temperature probes do not feature any connection polarity and can be extended using normal bipolar cable.

⚠ WARNING

INCORRECT OPERATION OF EQUIPMENT DUE TO CONNECTIONS

- Apply the electrical power supply to all devices powered externally after applying the electrical power to the XVD device.
- The signal cables (probes, digital inputs, communication, and relative power supplies) of the device must be routed separately from the power cables.

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

NOTICE

INOPERABLE DEVICE

Verify all wiring before switching on the electrical power.

Failure to follow these instructions can result in equipment damage.

NOTE: Extending the probes affects the electromagnetic compatibility (EMC) of the device.

NOTE: Probes requiring a specific polarity must respect the correct connection polarity.

3.1.6. SERIAL CONNECTIONS

Take great care when connecting the serial line. A connection error could cause a malfunction or prevent the equipment from working.

Label	Description
TTL	Use a 5-wire TTL cable up to 300 mm (11.18 in.) in length. An Eliwell-supplied TTL cable is recommended. Contact Eliwell Sales Office for item availability.
MFK	TTL serial present on the upper part of the device for connection to MFK.
Keyb	3-wire voltage LAN serial inside the door for connection to the SKP 10 terminal. Maximum distance 10 m (32.8 ft).

NOTE: The Keyb connection must be used to configure the device and to view the resources.

NOTE: It is recommended to use this connection to work temporarily on the driver.

3.2. WIRING DIAGRAMS

The key below refers to the following wiring diagrams:

Code (DIN IEC 757)	**English**	**English**
BK	Black	Black
BU	Blue	Blue
BN	Brown	Brown
RD	Red	Red
WH	White	White
YE	Yellow	Yellow
---	Signal	Signal
---	Transducer	Transducer
---	Transducer Power Supply	Transducer Power Supply

Incorrect wiring will cause irreversible damage to the **XVD** device.

NOTICE

INOPERABLE DEVICE

Verify all wiring before switching on the electrical power.

Failure to follow these instructions can result in equipment damage.

3.2.1. WIRING DIAGRAM MODEL XVD 420H LAN

	Label		**Terminal**	**Description**
OPEN COLLECTOR	DO2		2	OC output For connection of an external SSR relay.
	12 Vdc		3	12 Vdc power supply output. (for probes with 4...20 mA and Open Collector inputs).
OUTPUT VALVE STEPPER	W2-		4	W2 terminals for connection to valve second winder.
	W2+		5	
	W1-		6	W1 terminals for connection to valve first winder.
	W1+		7	
POWER SUPPLY	≂ / +		8	Power supply V≂ (+). Respect the polarity.
	≂ / -		9	Power supply V≂ (-). Respect the polarity.
NC	---		10	Terminal not connected.
OUTPUT DIGITAL	DO1	NO	11	DO1 relay Normally Open. For solenoid valve or alarm.
		C	12	DO1 relay Common terminal. For solenoid valve or alarm.
CONNECTION KEYBOARD	GND		---	(BK) 0 V signal earth.
	DATA		---	(BU) External keyboard data terminal
	12 V		---	(RD) +12 Vdc power output for external keyboard.
LAN	GND		14	0 V signal earth.
	sign		15	Analogue current output (4...20 mA).
	12 V		16	Analogue voltage output (0-10 V).
INPUTS DIGITAL	DI1		17	Digital input 1.
	DI2		18	Digital input 2.
EARTH	GND		19	0 V signal earth. Common connection for: • digital inputs (DI1, DI2). • analogue inputs (AI1, AI2, AI3, AI4).
5 Vdc	5 V		20	+5 Vdc power supply for ratiometric transducer.
INPUTS ANALOGUE	AI1		21	Analogue input 1 (Saturation probe).
	AI2		22	Analogue input 2 (Backup saturation probe).
	AI3		23	Analogue input 3 (Overheating probe).
	AI4		24	Analogue input 4 (Backup overheating probe).

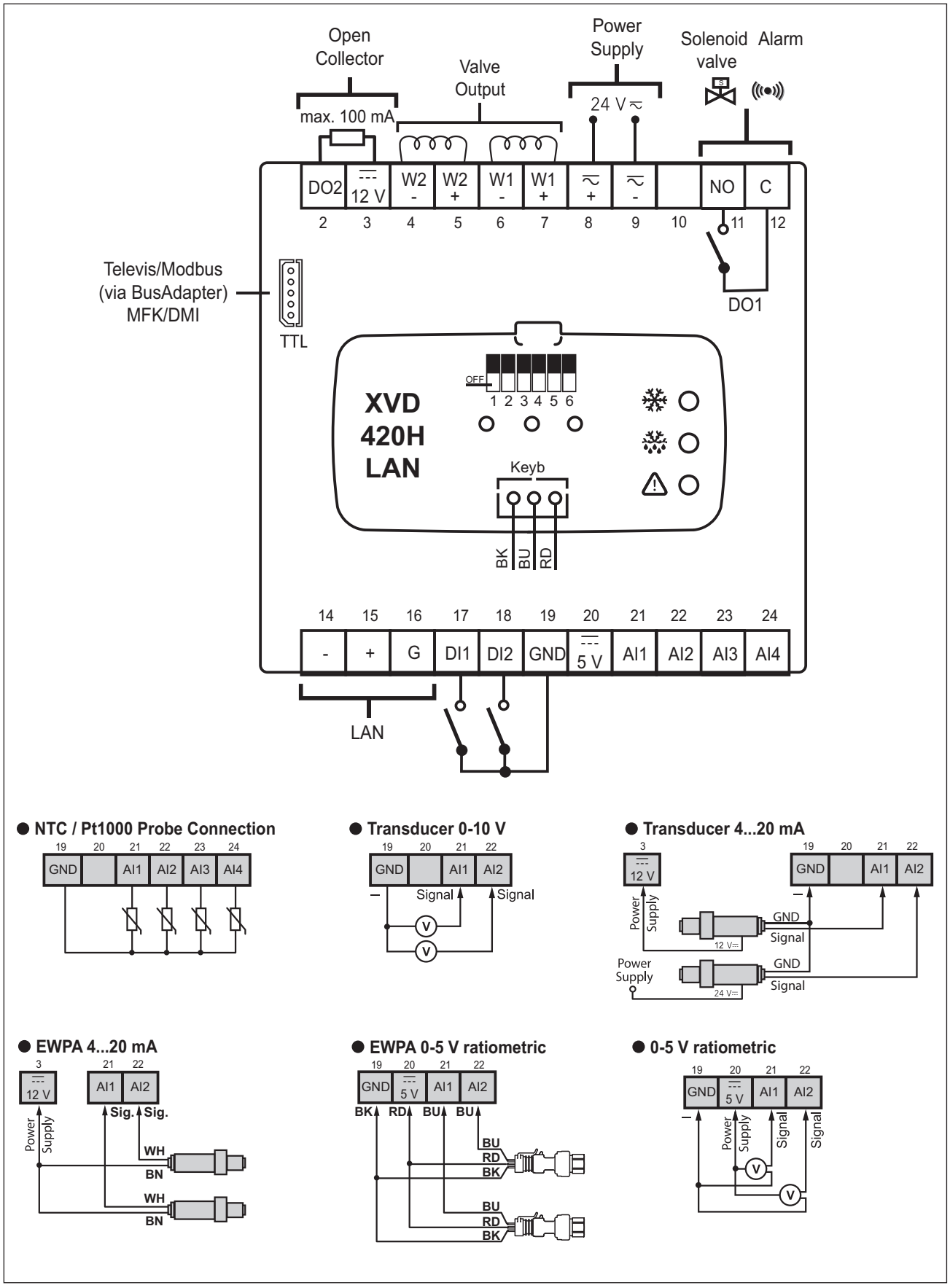


Fig. 12. Wiring diagram model **XVD 420H LAN**

3.2.2. WIRING DIAGRAM MODEL XVD 420H RS-485

	Label		Terminal	Description
OPEN COLLECTOR	DO2		2	OC output For connection of an external SSR relay.
	12 Vdc		3	12 Vdc power supply output. (for probes with 4...20 mA and Open Collector inputs).
OUTPUT VALVE STEPPER	W2-		4	W2 terminals for connection to valve second winder.
	W2+		5	
	W1-		6	W1 terminals for connection to valve first winder.
	W1+		7	
POWER SUPPLY	≂ / +		8	Power supply V≂ (+). Respect the polarity.
	≂ / -		9	Power supply V≂ (-). Respect the polarity.
NC	---		10	Terminal not connected.
OUTPUT DIGITAL	DO1	NO	11	DO1 relay Normally Open. For solenoid valve or alarm.
		C	12	DO1 relay Common terminal. For solenoid valve or alarm.
CONNECTION KEYBOARD	GND		---	(BK) 0 V signal earth.
	DATA		---	(BU) External keyboard data terminal
	12 V		---	(RD) +12 Vdc power output for external keyboard.
RS-485	-		14	"-" signal for RS-485 serial port.
	+		15	"+" signal for RS-485 serial port.
	G		16	0 V signal earth RS-485.
INPUTS DIGITAL	DI1		17	Digital input 1.
	DI2		18	Digital input 2.
EARTH	GND		19	0 V signal earth. Common connection for: • digital inputs (DI1, DI2). • analogue inputs (AI1, AI2, AI3, AI4).
5 Vdc	5 V		20	+5 Vdc power supply for ratiometric transducer.
INPUTS ANALOGUE	AI1		21	Analogue input 1 (Saturation probe).
	AI2		22	Analogue input 2 (Backup saturation probe).
	AI3		23	Analogue input 2 (Overheating probe).
	AI4		24	Analogue input 2 (Backup overheating probe).

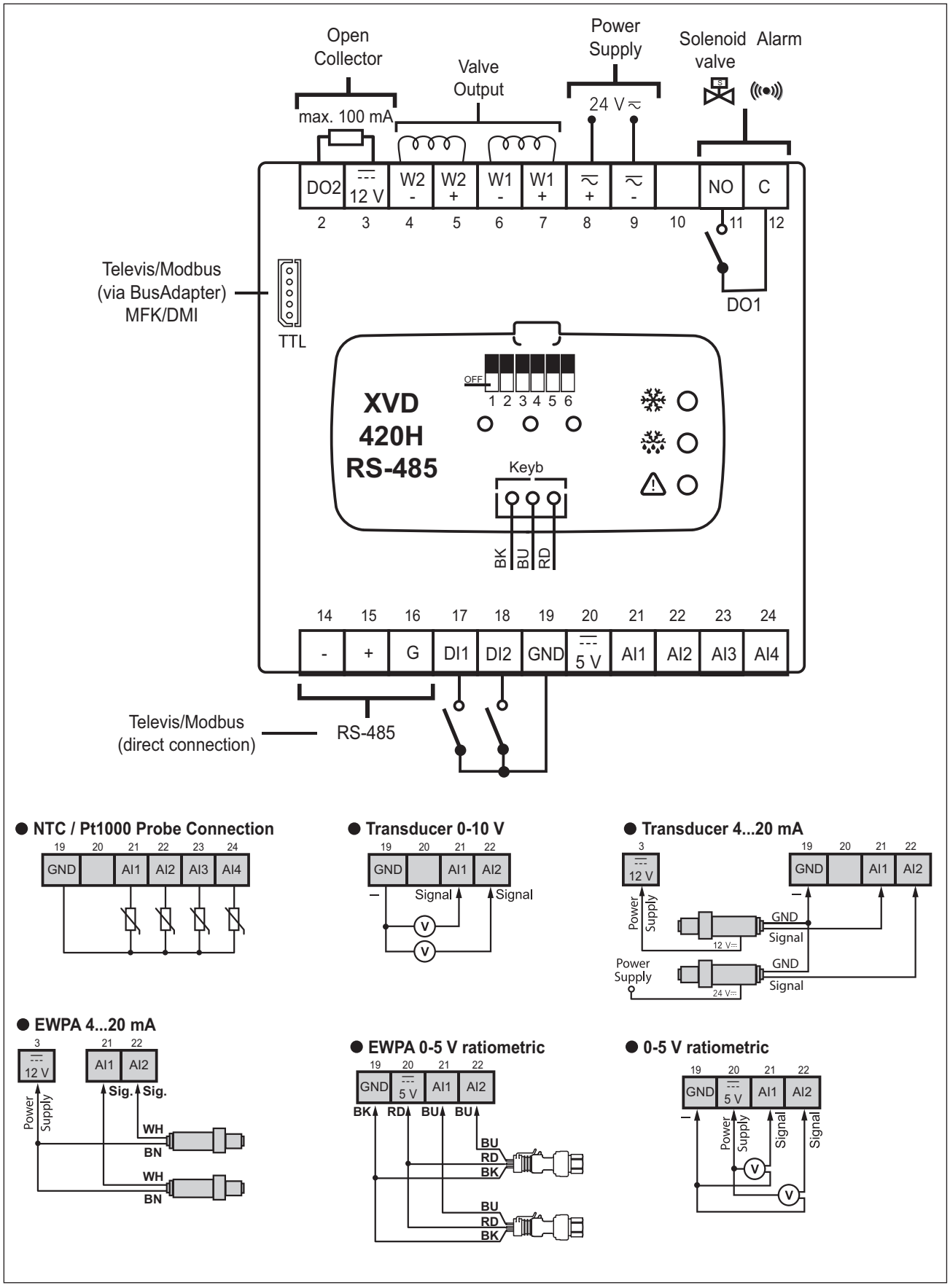


Fig. 13. Wiring diagram model **XVD 420H RS-485**

3.2.3. WIRING DIAGRAM MODEL XVD 420H DIGITAL

	Label		Terminal	Description
OPEN COLLECTOR	DO2		2	OC output For connection of an external SSR relay.
	12 Vdc		3	12 Vdc power supply output. (for probes with 4...20 mA and Open Collector inputs).
OUTPUT VALVE STEPPER	W2-		4	W2 terminals for connection to valve second winder.
	W2+		5	
	W1-		6	W1 terminals for connection to valve first winder.
	W1+		7	
POWER SUPPLY	≂ / +		8	Power supply V≂ (+). Respect the polarity.
	≂ / -		9	Power supply V≂ (-). Respect the polarity.
NC	---		10	Terminal not connected.
OUTPUT DIGITAL	DO1	NO	11	DO1 relay Normally Open. For solenoid valve or alarm.
		C	12	DO1 relay Common terminal. For solenoid valve or alarm.
CONNECTION KEYBOARD	GND		(BK)	0 V signal earth.
	DATA		(BU)	External keyboard data terminal.
	12 V		(RD)	+12 Vdc power output for external keyboard.
NC	NC		14	Terminal not connected.
NC	NC		15	Terminal not connected.
NC	NC		16	Terminal not connected.
INPUTS DIGITAL	DI1		17	Digital input 1.
	DI2		18	Digital input 2.
EARTH	GND		19	0 V signal earth. Common connection for: • digital inputs (DI1, DI2). • analogue inputs (AI1, AI2, AI3, AI4).
5 Vdc	5 V		20	+5 Vdc power supply for ratiometric transducer.
INPUTS ANALOGUE	AI1		21	Analogue input 1 (Saturation probe).
	AI2		22	Analogue input 2 (Backup saturation probe).
	AI3		23	Analogue input 2 (Overheating probe).
	AI4		24	Analogue input 2 (Backup overheating probe).

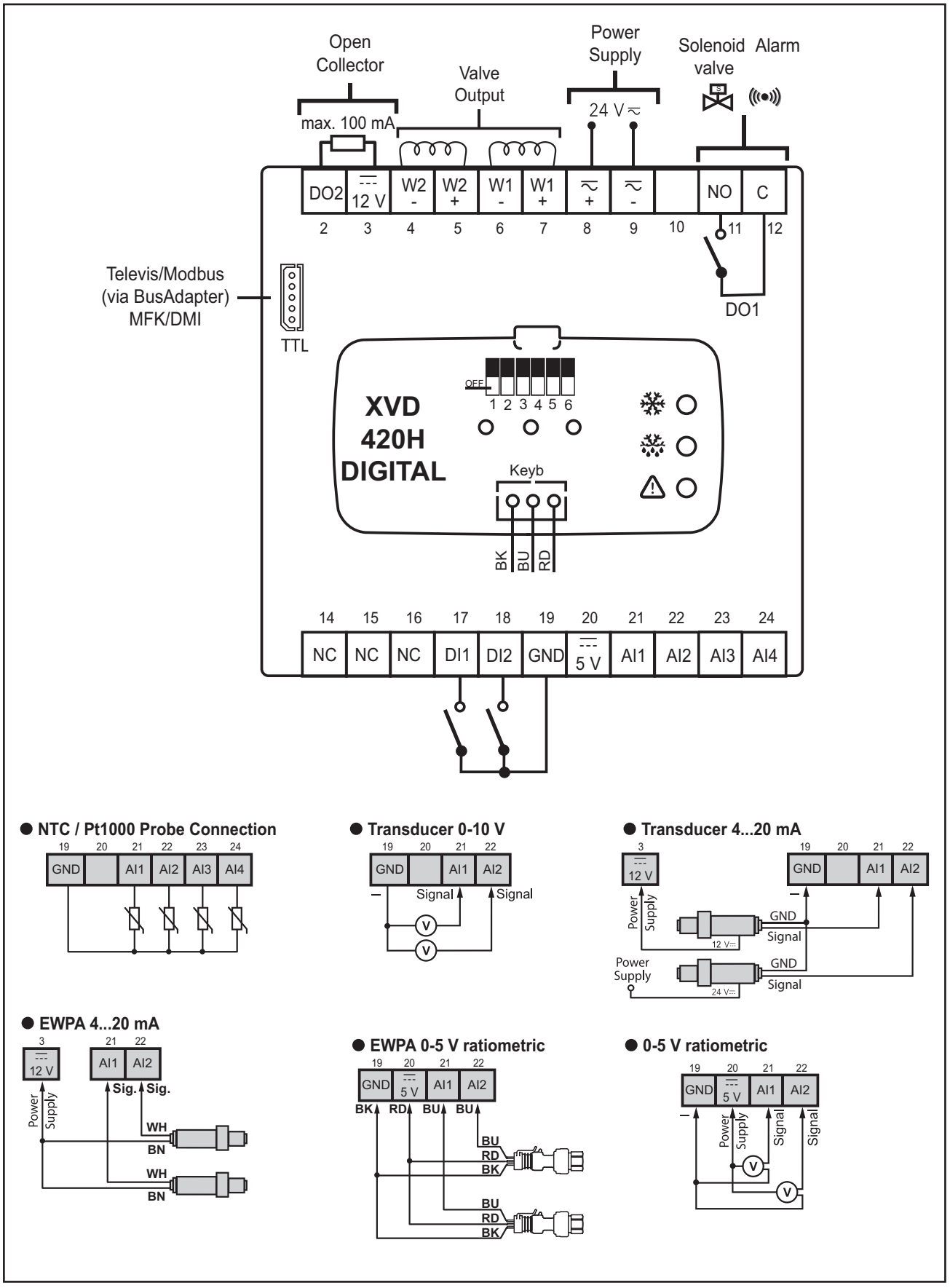


Fig. 14. Wiring diagram model **XVD 420H DIGITAL**

3.2.4. WIRING DIAGRAM MODEL XVD 100H ACTUATOR

	Label		Terminal	Description
OUTPUT VALVE STEPPER	W2-		4	W2 terminals for connection to valve second winder.
	W2+		5	
	W1-		6	W1 terminals for connection to valve first winder.
	W1+		7	
POWER SUPPLY	≂ / +		8	Power supply V≂ (+). Respect the polarity.
	≂ / -		9	Power supply V≂ (-). Respect the polarity.
NC	---		10	Terminal not connected.
OUTPUT DIGITAL	DO1	NO	11	DO1 relay Normally Open. For solenoid valve or alarm.
		C	12	DO1 relay Common terminal. For solenoid valve or alarm.
CONNECTION KEYBOARD	GND		(BK)	0 V signal earth.
	DATA		(BU)	External keyboard data terminal.
	12 V		(RD)	+12 Vdc power output for external keyboard.
EARTH	GND		19	0 V signal earth. Common connection for analogue input AI1.
5 Vdc	5 V		20	+5 Vdc power supply for ratiometric transducer.
INPUT ANALOGUE	AI1		21	Analogue input 1 (Saturation probe).

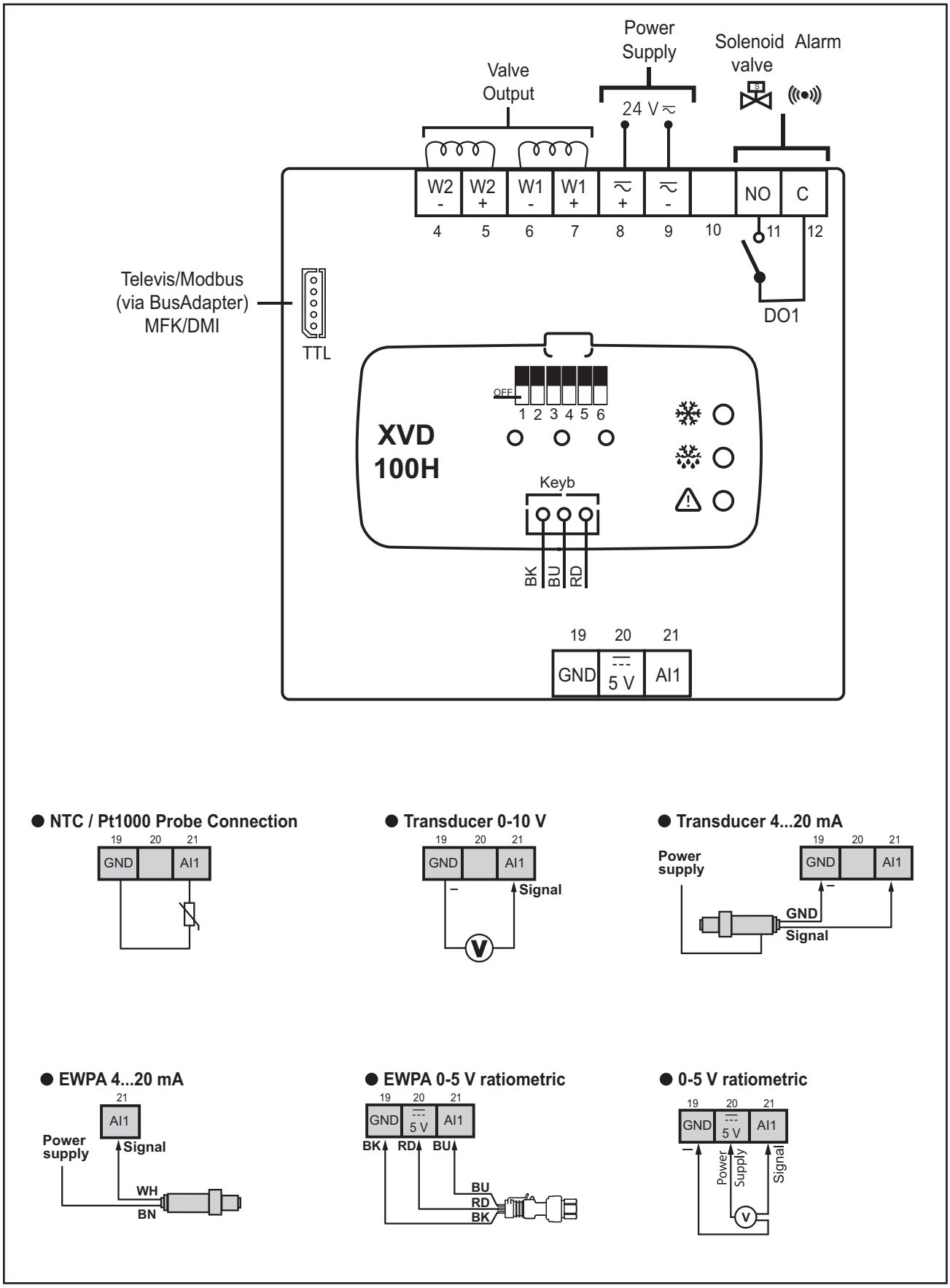


Fig. 15. Wiring diagram model **XVD 100H ACTUATOR**

3.3. XVD - SKP 10 CONNECTION

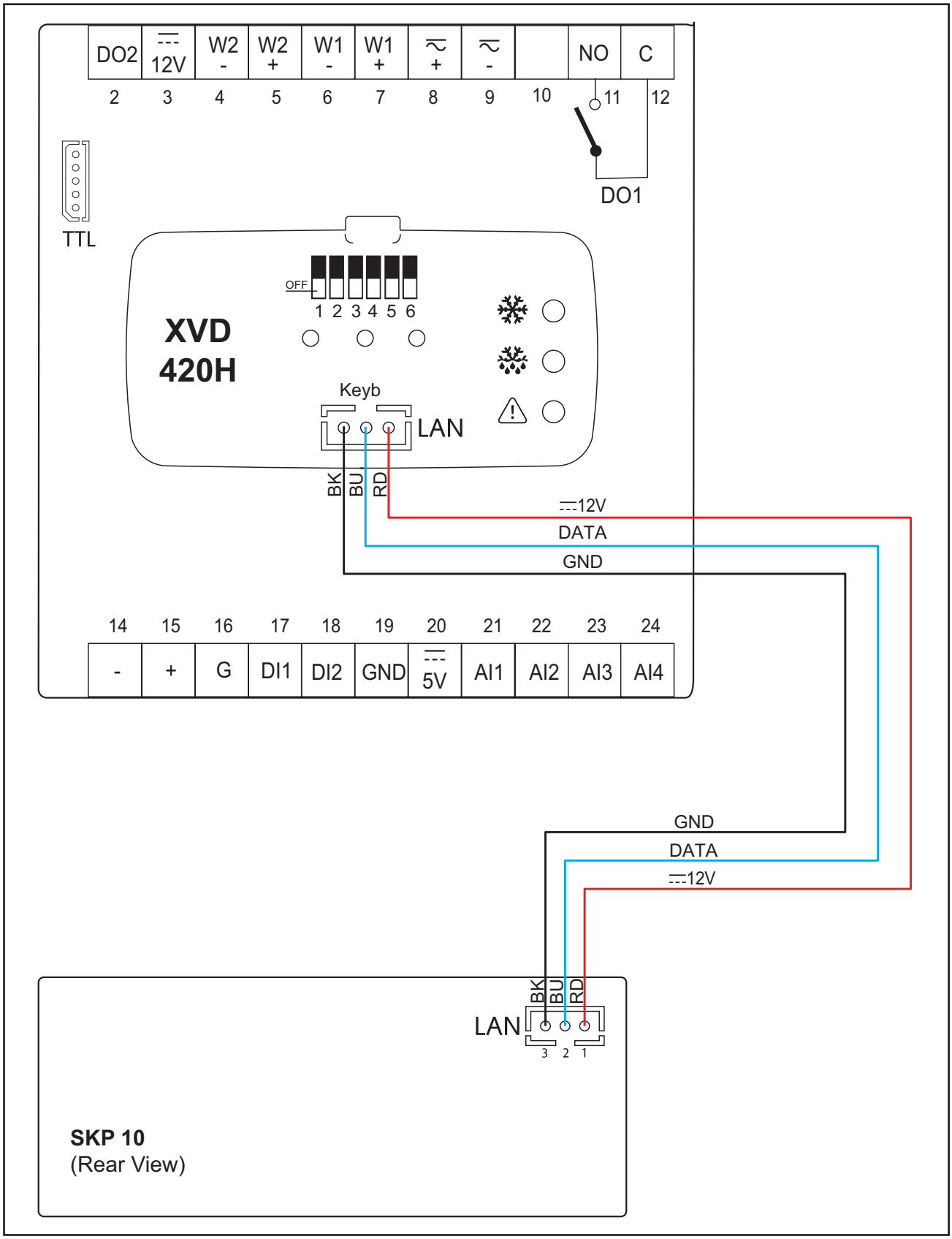


Fig. 16. Connection diagram **XVD** - **SKP 10**

3.4. VALVE CONNECTION

Here below is the connection diagram of **COMPATIBLE** valves
(refer to **'1.2. RANGE' on page 12**):

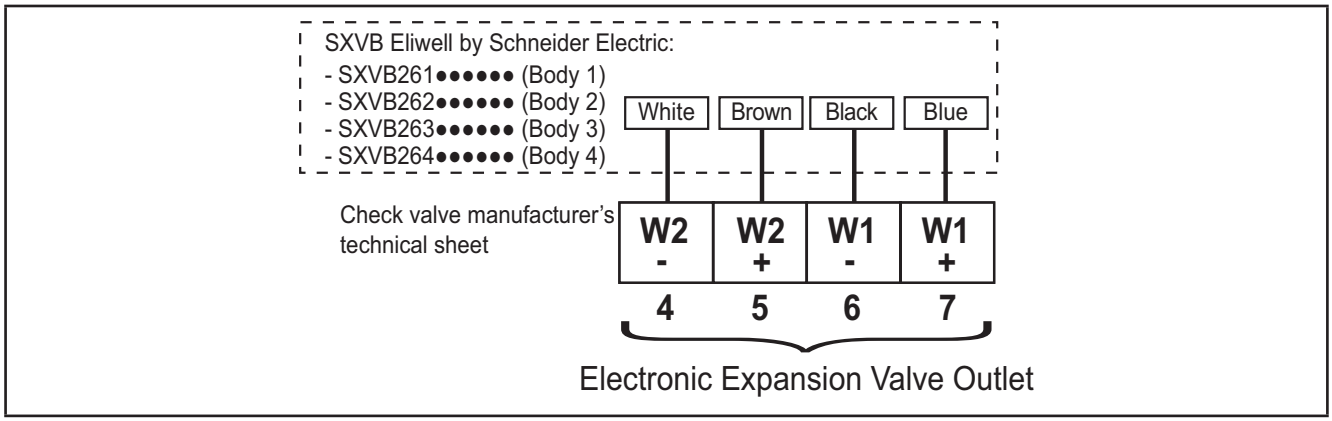


Fig. 17. Connection diagram of compatible valves

Here below is the connection diagram of **PILOTABLE** valves
(refer to **'1.2. RANGE' on page 12**):

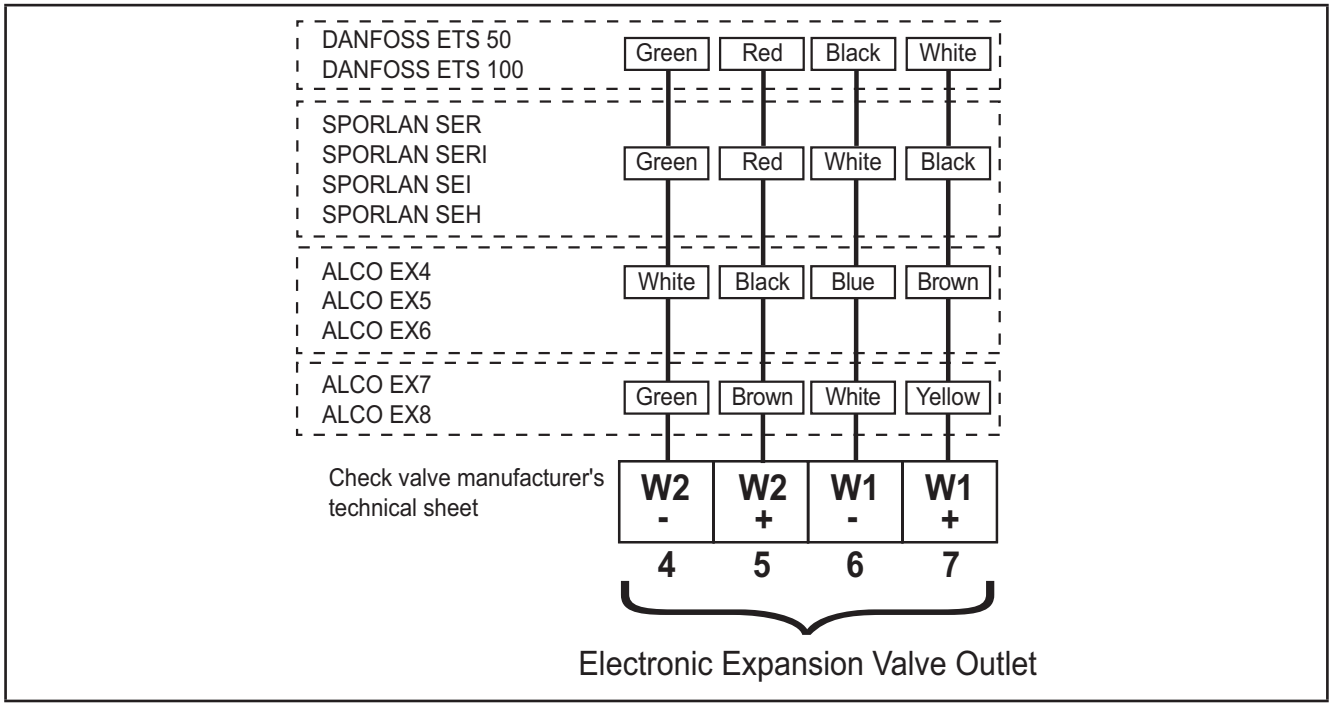


Fig. 18. Connection diagram of pilotable valves

The pilotable valve connection is obtained by referring to the following documents:

Producer	Valve	Reference document
DANFOSS	models ETS 50 / ETS 100	RK0YG302 dated 04/2007
SPORLAN	models SER / SERI/ SEI / SEH	Bulletin 100-20-1 dated 05/2004
ALCO	models EX4, EX5 / EX6 / EX7 / EX8	A3,5,008,5 dated 07/2004

CHAPTER 4
TECHNICAL DATA

All components in the **XVD** devices meet the European Community (CE) requirements for open devices.

They must be installed in a cabinet or other designated place to suit the environmental conditions and minimise the risk of involuntary contact with high voltages. Use metal casings to improve the immunity of the **XVD** device to electromagnetic fields.

This device meets the CE requirements indicated in the table below.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Do not exceed any of the nominal values specified in the “General specifications” tables.

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

The application of incorrect current and voltage values to the analogue inputs and outputs may damage the electronic circuits. Moreover, connecting a current input of a device to an analogue input configured for voltage and vice versa will also damage the electronic circuits.

NOTICE

INOPERABLE DEVICE

- Do not apply voltages over 11 V to the controller analogue inputs when the analogue input is configured as a 0-5 V or 0-10 V input.
- Do not apply currents over 30 mA to the controller analogue inputs when the analogue input is configured as a 4-20 mA input.
- Ensure that the signal applied corresponds to the analogue input configuration.

Failure to follow these instructions can result in equipment damage.

4.1. GENERAL SPECIFICATIONS

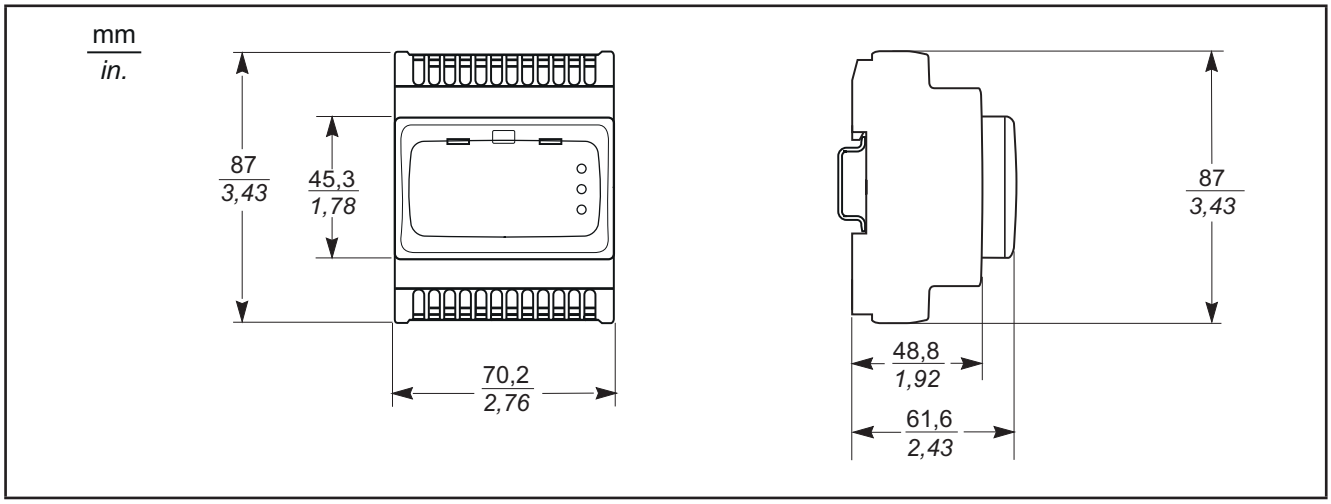
Feature	Description
It conforms to the following harmonised standards:	EN 60730-1 / EN 60730-2-9
Device construction:	built-in electronic control device
Application	Operating control. Expansion valve driver
Mounting method:	Mounting on DIN rail using the brackets
Type of action:	1.C
Pollution class:	2
Insulating material class:	IIIa
Over-voltage category:	Category I - power supply class 2 Category II - relay output
Nominal pulse voltage:	2500 V
Fire resistance category:	D
Software class:	A
Protection rating provided by outer casings	IPX0
Digital outputs:	Refer to the label on the device

Feature	Description
(NON-insulated) Power supply:	24 Vac/dc (±10 %)
Power supply frequency:	50/60 Hz
Absorbed power (maximum):	35 VA / 25 W
Insulation class	II
Environmental operating conditions:	Temperature: -10...65 °C (14...149 °F) Humidity: 10…90% RH (non-condensing)
Transportation and storage conditions:	Temperature: -20...85 °C (-4...185 °F) Humidity: 10…90% RH (non-condensing)
Maximum terminal temperature for internal conductors	105 °C (221 °F)
Control device classification in accordance with protection against electric shocks	Class 2 command for use in Class I equipment

4.2. MECHANICAL CHARACTERISTICS

The mechanical characteristics of the **XVD** are:

Dimensions	Length (L) (mm / in.)	Depth (d) (mm / in.)	Height (H) (mm / in.)	Notes
XVD cap	70.2 / 2.76	12.8 / 0.50	45.3 / 1.78	
XVD	70.2 / 2.76	61.6 / 2.43	87 / 3.43	4 DIN rail



The mechanical characteristics of the **SKP 10** are:

Dimensions	Length (L) (mm / in.)	Depth (d) (mm / in.)	Height (H) (mm / in.)	Notes
Front panel	76.4 / 3.01	4.7 / 0.19	35 / 1.38	
Measurements	76.4 / 3.01	30 / 1.18	28 / 1.10	
Hole for panel-mounting	71 / 2,80	-	29 / 1.14	
Maximum panel thickness	-	9 / 0.35	-	

4.3. INPUT/OUTPUT CHARACTERISTICS

The characteristics of the inputs on the **XVD** are as follows:

Feature	Description	420H LAN	420H RS-485	420H DIGITAL	100H
Display:	3 digits + sign	-			
Measurement range:	**NTC**: -50.0...99.9 °C (-58.0...211.8 °F)				
	NTC extended: -40.0...150 °C (-40.0...302 °F)				
	Pt1000: -50.0...99.9 °C (-58.0...211.8 °F)				
f.s. precision:	1%				
Resolution:	Temperature: 0.1°C (0.1°F) Current-Voltage: 0.1 bar				
Analogue Inputs:	**AI1**: 1 configurable analogue input (*)	YES	YES	YES	YES
	AI2: 1 configurable analogue input (*)	YES	YES	YES	NO
	AI3: 1 configurable analogue input (*)	YES	YES	YES	NO
	AI4: 1 configurable analogue input (*) (*) “Features of analogue inputs” table.	YES	YES	YES	NO
Digital inputs:	**DI1**: 1 voltage-free digital input; closure current for ground: 0.5mA	YES	YES	YES	NO
	DI2: 1 voltage-free digital input; closure current for ground: 0.5mA	YES	YES	YES	NO
Digital output:	**DO1**: 1 high voltage digital output (SPST relay): NA 5 A resistive 120/250 Vac (1.4 FLA - 7.5 LRA) 240 Vac	YES	YES	YES	YES
OC (Open Collector) Output:	**DO2**: 1 multifunctional output: 12 Vdc - 100 mA. Maximum current = 100 mA and Voltage = 12 Vdc	YES	YES	YES	NO

“ANALOGUE INPUT CHARACTERISTIC” table

	NTC*	NTC extended*	Pt1000*	4...20 mA	0-10 V	0-5 V
AI1	YES	YES	YES	YES	YES	YES
AI2	YES	YES	YES	YES	YES	YES
AI3	YES	YES	YES	NO	NO	NO
AI4	YES	YES	YES	NO	NO	NO
Impedance	-	-	-	100 Ω	21 kΩ	110 kΩ

NTC: **NTC 103AT-2 (10 kΩ at 25°C), BETA value 3435**
NTC extended: **NTC 103AP-2 (10 kΩ at 25°C), BETA value 3435**
(*) probes not included - contact the Eliwell Sales Office for per accessories

Analogue inputs configured as digital inputs are not isolated.

NOTICE

INCORRECT INPUT WIRING TO NON-ISOLATED INPUTS

Use only clean contact type inputs on analogue inputs configured as digital inputs.

Failure to follow these instructions can result in equipment damage.

4.4. SERIALS

Serial	Description	Notes
TTL	1 TTL serial	Connection between the controller and the accessories for rapid programming of UNICARD, Multi Function Key and Device Manager (via DMI)
RS-485	1 opto-isolated RS-485 serial port	(**420H RS-485 only**) If the controller is connected at the end of the RS485 communication line, apply a 120 Ω terminal resistor between the "+" and "-" line on the RS485
LAN	1 LAN serial	(**420H LAN only**) LAN serial for network connection.
KEYB	1 serial for connection to keyboard	3-way JST connector inside the door for connection to SKP 10 terminal

For more information refer to **'3.1.6. SERIAL CONNECTIONS' on page 27**.
Extreme care must be taken when connecting the serial lines. Incorrect wiring may cause the equipment to stop working.

4.5. POWER SUPPLY

The device can be powered at a voltage of 100...240 Vac (±10%) 50/60 Hz.

According to the requirements of the individual unit and/or the country of installation, if the mains voltage in the country is within the operating range, the controller can be connected directly to the mains.

⚠ ⚠ DANGER

AN EARTH LOOP CAUSES ELECTRICAL SHOCK AND/OR DAMAGE TO THE EQUIPMENT

- Do not connect the connection to 0 V on the power supply/transformer powering this device to an external earth connection (ground).
- Do not connect the connection to 0 V or earth (ground) on the sensors and actuators connected to this device to an external ground connection.
- If necessary, use separate power supplies/transformers to power the sensors and actuators isolated from this device

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

If the specified voltage field is not maintained, or if the actual separation of the SELV circuit connected to the equipment in question is compromised, the products might not work as they should or become damaged and be no longer usable.

⚠ WARNING

POTENTIAL OF OVERHEATING AND FIRE

- Do not connect the external valve power supply directly to mains power.
- To power this devices, use exclusively safe isolated power supplies/transformers with SELV ultra-low isolated voltage.

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

The device must be connected to an appropriate power supply/transformer with the following characteristics:

Primary voltage	Depending on requirements of the individual device and/or country of installation
Secondary voltage	24 Vac/dc
Power supply frequency Vac	50/60 Hz
Power supply	35 VA / 25 W
Power supply fuse	Fuse type T 3.15 A

CHAPTER 5
USER INTERFACE

The interface, comprising the front cover of the controller, allows you to perform all operations needed to use the device.

5.1. XVD LED

On the front of the **XVD** driver there are 3 LEDs which indicate the valve state.

Inside the door there are 3 more LEDS used to upload/download parameters and/or applications (**'CHAPTER 9' on page 63**)

	LED	Colour	On	Flashing		Off
	EEV*	Green	Valve regulation	Valve closed (no adjustment in progress) Setpoint satisfied		NA**
	Defrost*	Yellow	Defrost in progress Valve closed (no adjustment in progress)	No serial connection		No defrost
	Alarm	Red	NA	Alarm present	No serial connection	No alarm

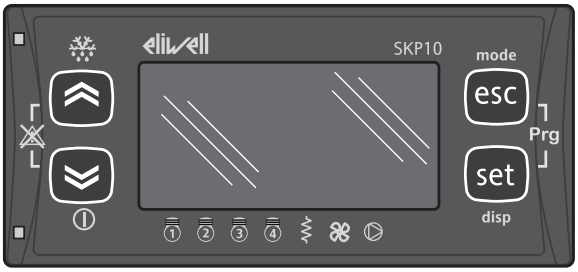
(*) On **XVD 100H** the EEV and Defrost LEDs are not used.

(**) The EEV LED off indicates driver power failure.

5.2. SKP 10

The **XVD** driver is a blind module, with no display. To work on the device, use the **SKP 10** terminal.

The values shown on the **SKP 10** terminal can have at most 4 digits or 3 digits plus a sign.



KEYS

	Key	Single press (press and release)	Long press
⌃⌃	UP	• Rapid overheating Setpoint modification* • Increase value / Move to next label	: NOT USED
⌄⌄	DOWN	• Rapid overheating Setpoint modification* • Decrease value / Move to previous label	: NOT USED
esc	esc	• Exit without saving new settings • Go back to previous level	**mode:** NOT USED
set	set	• Confirm value / exit and save new settings • Move to next level • Go to the States Menu (open folder, subfolder, parameter, value)	**disp** see **'5.4. MAIN DISPLAY SETTINGS' on page 45**
esc + set	esc+set	Opens the Programming Menu	**Prg** see **'5.4. MAIN DISPLAY SETTINGS' on page 45**
⌃⌃ + ⌄⌄	UP+	Alarm acknowledgement	: NOT USED

** Also modifiable from parameter dE31 and dE32.*

LED

The display shows the value/resource set for the “main display”.

If an alarm is given the E **xx** alarm code will alternate (if there are several alarms, the code with the lower value will be shown).

No.	Colour	Description	Notes
	Red	Menu (ABC)	-
	Red	Shows pressure (bar)	Values are in relative bars. If the value is PSI, the symbol does not appear
	Red	Shows temperature (°C)	If the value is °F the symbol does not appear
	Red	Alarm	-

5.3. ACCESS TO FOLDERS - MENU STRUCTURE

Folders are arranged into menus.
Access to said folders is defined by the keys on the front cover as shown in **‘5.2. SKP 10’ on page 43**.

In the section that follow (or chapters indicated), we will explain how to enter each individual menu.

There are 2 menus:

- “States” menu: see **‘5.5. STATES MENU’ on page 46**;
- “Programming” menu. see **‘5.6. PROGRAMMING MENU’ on page 49**.

In the “Programming” menu there are 3 folders/ sub-menus:

- “Parameters” menu (PAr folder): see **‘CHAPTER 12’ on page 73**;
- “MFK” menu (FnC folder): see **‘CHAPTER 9’ on page 63**;
- “PASS” password: see **‘CHAPTER 12’ on page 73**.

5.4. MAIN DISPLAY SETTINGS

“Main Display” is what the instrument displays by default, i.e. when the keys are not being used.

The **XVD** main display can be customised to suit personal requirements.

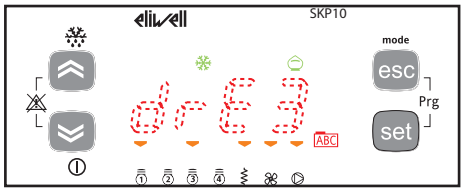
Choose the required display from the”**disp**” menu. To access the “**disp**” menu press and hold down the “**set**” key for more than 3 seconds. The main display can be selected from the following:

Label	Description*	Display value	Display value if probe in error (backup)
drE1	Overheating temperature	**dAi3** Probe overheating	**dAi4** Backup probe overheating
drE2	Saturation temperature of refrigerant	**dAi1** Saturation probe	**dAi2** Backup saturation probe
drE3	Overheating temperature Backup probe	**dAi4**	--- (three dashes)
drE4	Saturation temperature of the back-up Probe refrigerant	**dAi2**	--- (three dashes)
drE5*	Overheating	Difference **drE1-drE2**	NA
drE6	Refrigerant Pressure	**dAi1** For configuring the probe as a saturation 4..20mA or ratiometric probe	**dAi2**: For configuring the probe as a backup saturation 4..20mA or ratiometric probe **Otherwise**: --- (three dashes)
drE7	Valve opening percentage	value opening percentage value (0...100%)	--- (three dashes)

(*) *Default.*

NOTES: • The analogue inputs are factory-set.
• The probe display is always at temperature
(see **‘5.5.2. INPUT/OUTPUT DISPLAY’ on page 48**).

A step by step illustration of how to proceed is provided below.

Display settings	
	To open the “disp” menu to modify the main display setup, press and hold the set key for at least 3 seconds.
	This will open the flashing menu on the previous display (in this case drE3).
	To modify the display, scroll the menu using the “UP” and “DOWN” keys and press the set key to confirm. When you have decided the type of display (e.g. **drE1**), press “set” to confirm. You will be automatically returned to the main display set.

5.5. STATES MENU

The resources value can be viewed in the states menu.

The setpoint can be viewed and modified.

Resources can be present / not present depending on the model (e.g. **DO2** is not present on **XVD 100H**).

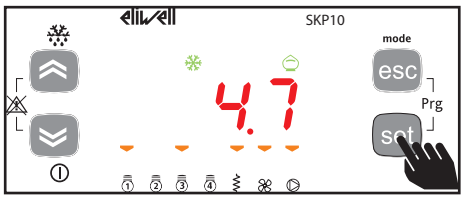
Label	Setpoint				Description	Edit
rE	drE1	drE2	...	drE7	Display main	**NO** In this menu display only. For the programming see: **'5.5.1. SETPOINT PROGRAMMING' on page 46**
Ai	dAi1	dAi2	dAi3	dAi4	Analogue inputs	No
of	ddi1	ddi2	-	-	Digital inputs	No
dO	ddO1	ddO2	-	-	Digital outputs	No
AL	Er01	Er02	...	Er15	Alarms	No
SP	SP1	SP2	SP3	SP4	Setpoint	Yes (not SP4)

5.5.1. SETPOINT PROGRAMMING

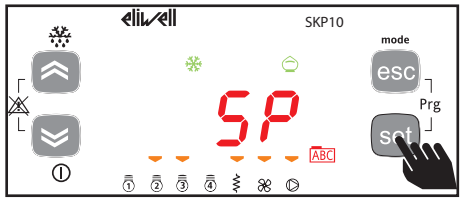
Setpoint	Description	Settable by parameter	Notes
SP1	setpoint minimum overheating	dE32	If dE30 = 1 it is understood as objective overheating. Fast change using "UP" and "DOWN" keys.
SP2	setpoint maximum overheating	dE31	If dE32 = 0 it is understood as single overheating setpoint.
SP3	MOP setpoint	dE52	Expressed in temperature units.
SP4	setpoint dynamic overheating	Display only. Cannot be edited. Calculated dynamically.	Valid if dE30=1. If dE30 = 0 the set is defined by dE32.

A step by step illustration of how to proceed is provided below.

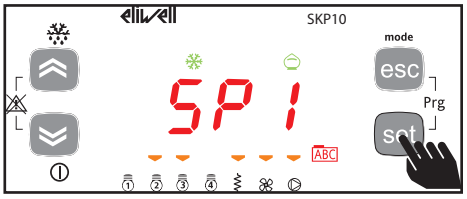
Setpoint Programming



To access the States Menu, press and release the “set” key
Label rE appears on the display.
(Use the “UP” and “DOWN” keys to scroll the other labels until you find the SP label)

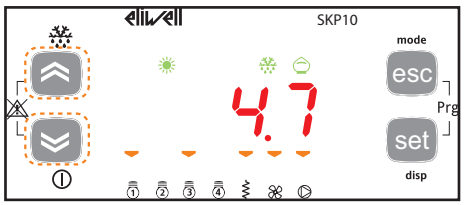


Press the “set” key to view the label of the first setpoint SP1.

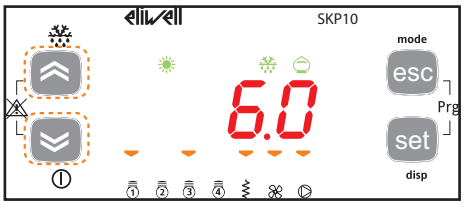


Press the “set” key again to view the value of SP1
(press the “UP” and ‘“DOWN” keys to view the other setpoints).
To modify the display use the “UP” and “DOWN” keys and press the “set” key to confirm.
Press “set” to confirm. You will be automatically returned to the main display set.

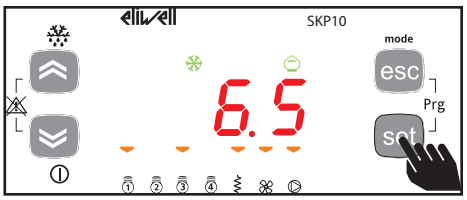
Fast programming of Setpoint SP1



To quickly modify the setpoint use the “UP” and “DOWN” keys.



The current setpoint value will appear on the display.
To modify the value use the “UP” and “DOWN” keys and press the “set” key to confirm.

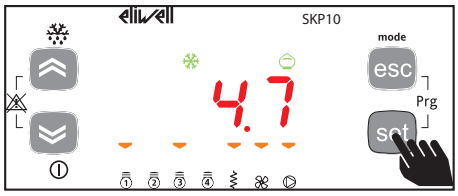
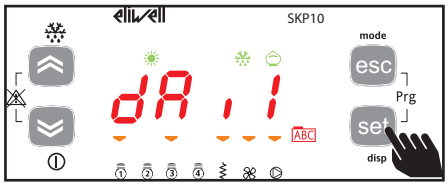
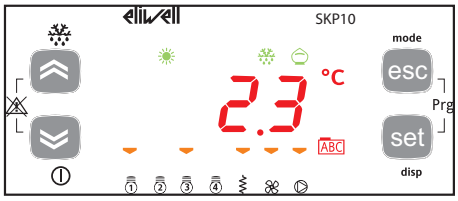


Press “set” to confirm.
You will be automatically returned to the main display set.

5.5.2. INPUT/OUTPUT DISPLAY

A step by step account of how to display the analogue inputs are given below.

The procedure is the same for other I/Os*.

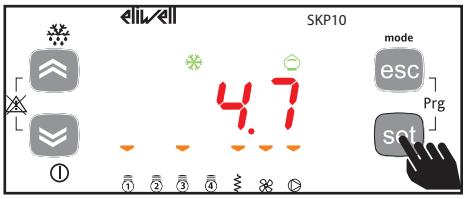
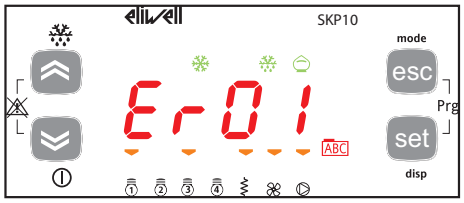
Input/output display	
	To access the States Menu, press and release the “set” key Label rE appears on the display. (Use the UP and DOWN keys to scroll the other labels until you reach dAi).
	Press the “set” key to view the label for the first analogue input (dAi1 in this case).
	Press the “set” key again to view the value of dAi1. Note that the °C icon lights up to indicate that the value shown is in degrees centigrade. Press the “esc” key repeatedly to go back to the main display.

** for Digital inputs the value is:*

- **0** = *input not active (for digital inputs this is equivalent to input open)*
- **1** = *input active (for digital inputs this is equivalent to input short-circuited to ground).*

5.5.3. ALARM DISPLAY (AL)

A step by step illustration of how to proceed is provided below.

Alarm Display	
	To access the States Menu, press and release the “set” key Label rE appears on the display. (Use the “UP” and “DOWN” keys to browse the other labels until you find the AL label).
	Press the “set” key to view the label of the first active alarm (if it exists).
	In this case, the first alarm is Er01. Scroll using the “UP” and “DOWN” keys to find other active alarms. **NOTE**: The menu is not cyclical. For example, if the active alarms are Er01 and Er02, the display will show: **Er01 ->Er02<Er01** **NOTE**: -> UP, <- DOWN Press the “esc” key repeatedly to go back to the main display.

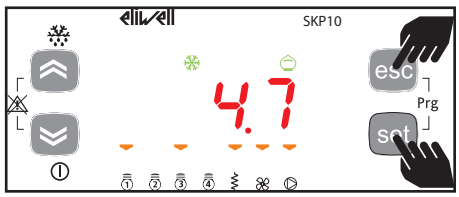
5.6. PROGRAMMING MENU

Programming menu	Label			
Parameter folder	PAr			
Parameters sub-folders	dL	dF	dE	Ui
Functions Folder	FnC	-		
Password folder	PASS			

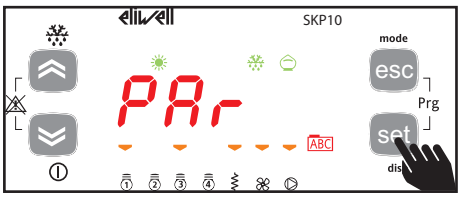
5.6.1. PARAMETERS (PAr)

A step by step illustration of how to proceed is provided below.

Modifying a parameter

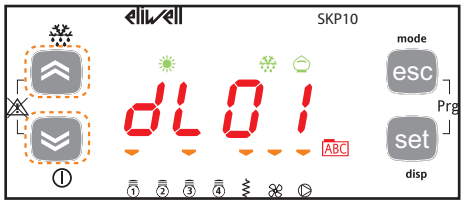


To view the Parameters Menu (PAr), press “Esc” and “Set” at the same time.



The Parameters Menu PAr contains all controller folders. Press the “set” key to view the folders.

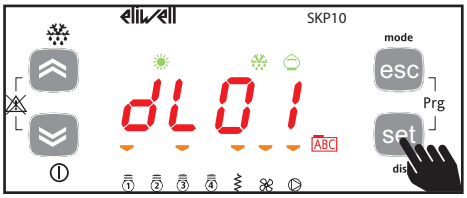
The first folder the controller shows is the dL configuration folder. Press the “set” key again to modify the dL parameters.



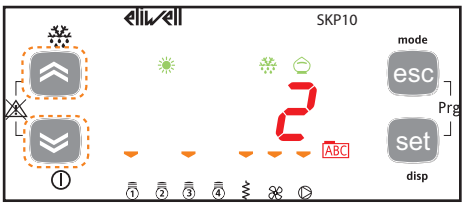
The controller will show parameter dL00 (factory default settings). Press the “UP” key to scroll through the various parameters or move to the next parameter (dL01 in this case) or the “DOWN” key to go back to the previous parameter (dL91 in this case)

dL00 -> dL01 -> dL02 -> … -> dL91 -> dL00
dL91 <- dL00 <- dL01 <- … <- dL90 <- dL91

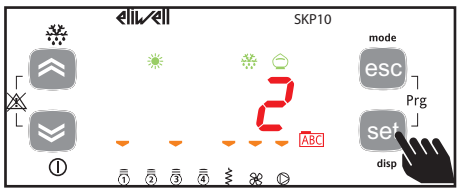
NOTE: -> UP, <- DOWN



To view the parameter value (dL01 in this case), press the “set” key.



For parameter dL01, the value shown will be 2.
To change the parameter value, press the “UP” and “DOWN” keys.



Having selected a value, press the “set” key.**
To exit this display and return to the previous level, press the “esc” key.

*** Press the “set” key to confirm the changed value; press the Esc key to returns to the previous level without saving the new value entered.*

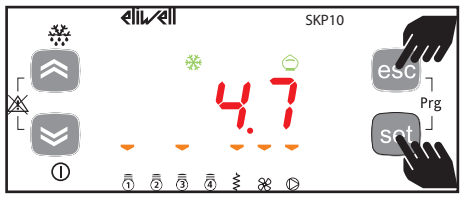
5.7. MULTI FUNCTION KEY (PAr/FnC)

See **‘CHAPTER 9’ on page 63**.

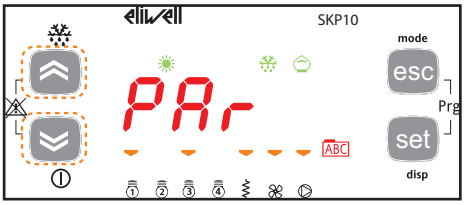
5.8. SETTING THE PASSWORD (PAr/PASS)

Access the PASS folder (basic view by pressing “esc” + “set” and search the folder using the “UP” and “DOWN” keys); Set the PASS value to have access to the parameters visible for that password.

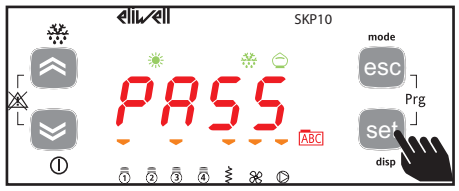
Setting the password



To view the PASS folder in the main display, press “Esc” and “Set” at the same time.



The menu showing the list of folders will be displayed.
Use the “UP” and “DOWN” keys to find the PASS folder.



Press the “set” key to enter the PASS folder.
From here, set the password (installer or manufacturer), press “set” and exit.
Now open and view parameters to change a value (see **‘CHAPTER 12’ on page 73**).

CHAPTER 6
PHYSICAL I/O CONFIGURATION

INTRODUCTION

New input modules, output modules or other devices not documented in the following information are regularly available. For information on new devices, contact your local Eliwell Controls representative.

NOTICE

INOPERABLE DEVICE

Each time a new Input/Output expansion model or other device recently released on to the market for this equipment is installed, update the controller firmware to the latest version.

Failure to follow these instructions can result in equipment damage.

NOTE: For further information on how to update the controller firmware, contact your local Eliwell Controls rep.

The application of incorrect current and voltage values to the analogue inputs and outputs may damage the electronic circuit. Moreover, connecting a current input device to an analogue input configured for voltage and vice versa will also damage the electronic circuit.

NOTICE

INOPERABLE DEVICE

- Do not apply voltages over 11 V to the controller analogue inputs when the analogue input is configured as a 0-5 V or 0-10 V input.
- Do not apply currents over 30 mA to the controller analogue inputs when the analogue input is configured as a 4-20 mA input.
- Ensure that the signal applied corresponds to the analogue input configuration.

Failure to follow these instructions can result in equipment damage.

6.1. ANALOGUE INPUTS

There are a total of four analogue inputs, referred to below as AI1…AI4.

Using the parameters, a physical resource (probe, digital input, voltage/current signal) can be “physically” configured for each type of input.

Inputs can be “physically” configured as specified in the following table.

PAR.	Description	0	1	2	3*	4*	5*	6
dL00	Input type analogue AI1	Probe not configured	NTC	Pt1000	4...20 mA	Ratiometric 0-5 V	0-10 V	NTC extended
dL01	Input type analogue AI2	Probe not configured	NTC	Pt1000	4...20 mA	Ratiometric 0-5 V	0-10 V	NTC extended
dL02	Input type analogue AI3	Probe not configured	NTC	Pt1000	-	-	-	-
dL03	Input type analogue AI4	Probe not configured	NTC	Pt1000	-	-	-	-

** If **dL00/dL01** = 3, 4 or 5, the value read by the probe is automatically converted into a saturation temperature value.*

Analogue input	Parameter	Range	Description
AI1	dL10	dL11...999.9	Analogue input AI1 fullscale value
AI1	dL11	-14.5...dL10	Analogue input AI1 start of scale value
AI2	dL12	dL13...999.9	Analogue input AI2 fullscale value
AI2	dL13	-14.5...dL12	Analogue input AI2 start of scale value

The values read by analogue inputs can be configured in the parameters dL20...dL23

PAR.	Description	Unit of measure	Range
dL20	Analogue input AI1 differential	bar/PSI -°C/°F	-12.0...12.0
dL21	Analogue input AI2 differential	bar/PSI -°C/°F	-12.0...12.0
dL22	Analogue input AI3 differential	°C/°F	-12.0...12.0
dL23	Analogue input AI4 differential	°C/°F	-12.0...12.0

The analogue inputs can be configured according to the following table.

PAR.	Function	Value	Description	Factory settings
dL30	Configuration analogue input AI1	0...5	• **0**= disabled • **1**= evaporator output (overheating) • **2**= saturation • **3**= backup evaporator output (overheating) • **4**= backup saturation • **5**= valve opening direct control	Saturation probe
dL31	Configuration analogue input AI2	0...5		Backup saturation probe di backup
dL32	Configuration analogue input AI3	0...4	• **0**= disabled • **1**= evaporator output (overheating) • **2**= saturation • **3**= backup evaporator output (overheating) • **4**= backup saturation	Evaporator output probe (overheating)
dL33	Configuration analogue input AI4	0...4		Evaporator output probe (overheating)

6.1.1. VALVE OPENING DIRECT CONTROL

If inputs **AI1** and **AI2** are “physically” configured in voltage or current, they are configurable for valve opening direct control as shown in the following table.

PAR.	Function	Value
dL00	Analogue input AI1 type	3-4-5
dL01	Analogue input AI2 type	3-4-5
dL30	Analogue input AI1 configuration	5
dL31	Analogue input AI2 configuration	5

In this case the input is converted linearly as a percentage, again using the parameters:

PAR.	Function	Range
dL10	Analogue input AI1 fullscale value	dL11...999.9
dL11	Analogue input AI1 start of scale value	-14.5...dL10
dL12	Analogue input AI2 fullscale value	dL13...999.9
dL13	Analogue input AI2 start of scale value	-14.5...dL12

You must set:

AI1:

- dL10 to a value corresponding to a signal of 10V or 20mA
- dL11 to a value corresponding to a signal of 0V or 4mA

AI2:

- dL12 to a value corresponding to a signal of 10V or 20mA
- dL13 to a value corresponding to a signal of 0V or 4mA

Valve opening percentage

- **AI1(AI2) < -5.0**: a valve opening percentage of 0% is controlled with override (reset, repeated until the signal stays below -5.0)
- **-5.0 < AI1 < 0.0**: valve opening percentage of 0% is controlled
- **AI1(AI2) > 0.0**: valve opening percentage is equal to the AI1 value (AI2).

6.2. DIGITAL INPUTS

There are of 2 no voltage digital inputs referred to below as DI1/DI2.

The Digital inputs can be configured as shown in the following table.

PAR.	Function	Value	Description	Notes
dL40	Configuration digital input DI1	-7...7	• **0** = digital input not configured • **±1** = ON/OFF adjustment • **±2** = defrost • **±3** = alarm • **±4** = system operating mode (only modes 0 and 1) • **±5** = main serial communication protocol • **±6** = ON/OFF adjustment with delay (*in OFF, **XVD** forces the opening to 50% for 40 seconds)* • **±7** = complete valve opening	• The positive values (+) indicate active for closed contact, the negative values (-) indicate active for open contact. • If configured (values ≠ 0) the digital inputs always have priority over any serial commands • dL40 = dL41 digital input ddL1 has priority.
dL41	Configuration digital input DI2	-7...7		

6.3. DIGITAL OUTPUTS

See **'3.2. WIRING DIAGRAMS' on page 28** for the number and capacity of relays/open collectors and for information on the symbols used on labels supplied with the device.

- Output in dangerous voltage (relay) is called DO1;
- The non-dangerous voltage (SELV), open collector output is called DO2.

PAR.	Function	Value	Description	Notes
dL90	Configuration digital output DO1 (on relay)	-2...2	• **0** = output controlled from serial • **±1** = solenoid valve control • **±2** = alarm output	• The positive values (+) indicate active for closed contact. • The negative values (-) indicate active for open contact.
dL91	Configuration digital output DO2 (Open Collector)	-2...2	• **0** = output controlled from serial • **±1** = solenoid valve control • **±2** = alarm output	

6.4. DIP-SWITCH TABLE

Inside the door there are 6 selectors (DIP Switches) used for quick selection of refrigerant as well as selection of network address and use of MFK.

The operations can also be done from the **SKP 10** terminal by appropriately configuring the dF folder parameters.

The refrigerant can be selected using parameter dE02. In this case set the DIP switches to configuration 7 according to the table below.

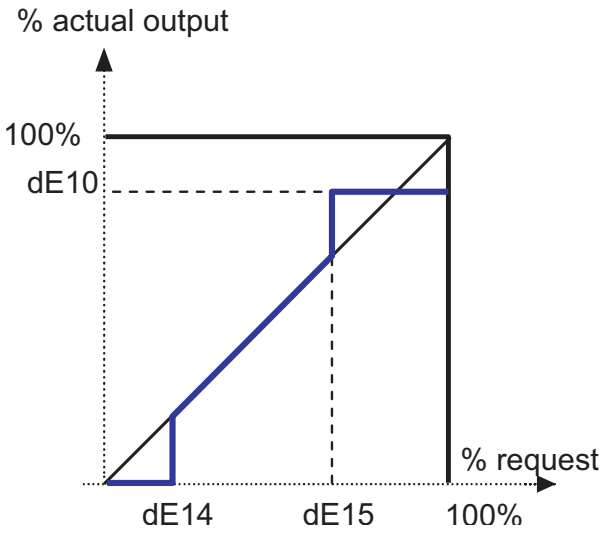
Function	Configuration	Refrigerant	Selectors (DIP switches)					
			1	2	3	4	5	6
Select refrigerant	0	R404A	-	-	-	OFF	OFF	OFF
	1	R448A	-	-	-	ON	OFF	OFF
	2	R410A	-	-	-	OFF	ON	OFF
	3	R134a	-	-	-	ON	ON	OFF
	4	R744 (CO_2)	-	-	-	OFF	OFF	ON
	5	R407C	-	-	-	ON	OFF	ON
	6	R427A	-	-	-	OFF	ON	ON
	7	Set by parameter dE20 **Default: R290**	-	-	-	ON	ON	ON
	Configuration	**Action**	**1**	**2**	**3**	**4**	**5**	**6**
Upload/Download parameters from MFK	8	Upload XVD➔MFK	ON	OFF	-	-	-	-
	9	DOWNLOAD: MFK➔XVD	OFF	ON	-	-	-	-
	XVD address		**1**	**2**	**3**	**4**	**5**	**6**
Select network address	0		-	-	OFF	-	-	-
	1		-	-	ON	-	-	-

CHAPTER 7
FUNCTIONS

XVD is a stepper type electronic expansion valve that regulators the minimum overheating value at the evaporator output.

The control value is the percentage of valve opening which is translated into a percentage of valve output enabling according to the following parameters:

- **dE10**: Maximum valve opening percentage is the maximum opening of the valve
- **dE14**: Minimum valve useful opening percentage is the minimum useful valve opening
- **dE15**: maximum valve useful opening percentage is the maximum useful valve.
- If the regulator controls an output of more than or equal to**dE15**, the actual output is equal to **dE10**.
- If **dE15** > **dE10** the function is ignored.
- If the regulator controls an output of less than or equal to **dE14**, the actual output is equal to 0.
- If the regulator controls an output of more than or equal to **dE10**, for more than the time set in **dE13** a maximum opening alarm **dA07** is generated to indicate a critical system situation such as insufficient load, undersizing, etc.
- To disable the signal, set **dE13** = 0.



7.1. PID CONTROL ALGORITHM

XVD calculates the actual overheating value using the two analogue inputs, overheating AI3 and saturation AI1.

A PID controller modulates the valve opening so make the overheating reach the setpoint **dE32**. The algorithm is dynamic: the effective overheating value may not reach the set Setpoint or may temporarily fall below this value. (Valid for **dE30** = 1 - Overheating recalculation enabled).

If this causes liquid to leak from the evaporator the Setpoint **dE32** value must be increased.

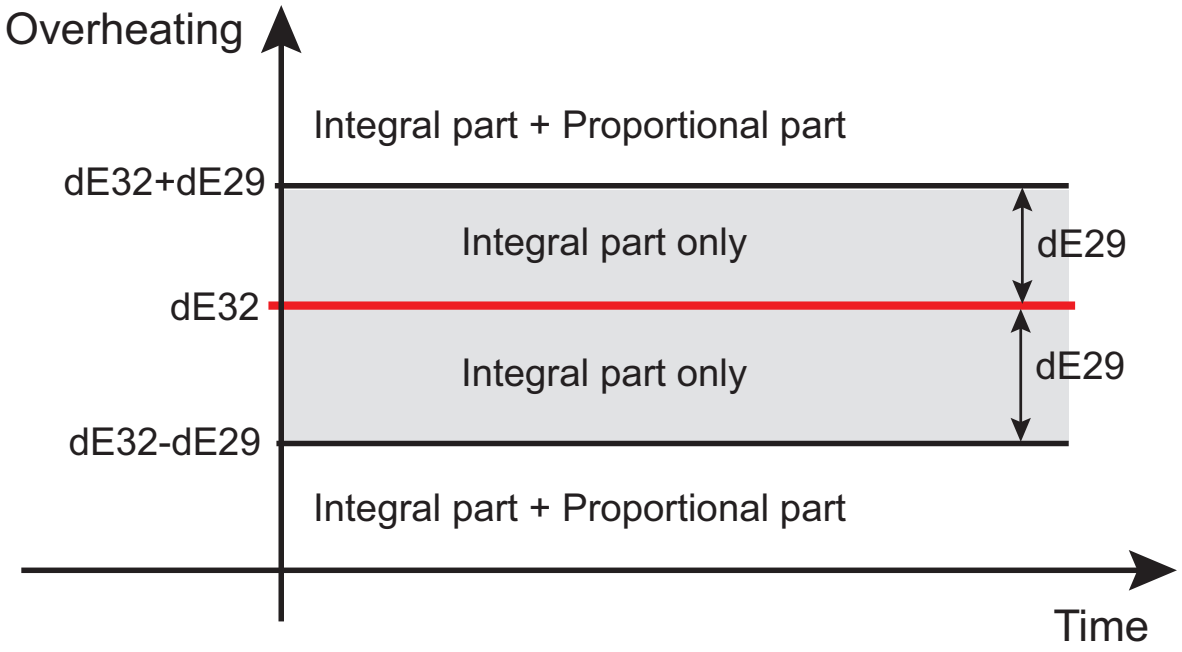
7.2. THRESHOLD CONTROL ALGORITHM

To activate the cut-in threshold control algorithms set **dE25** = 1.

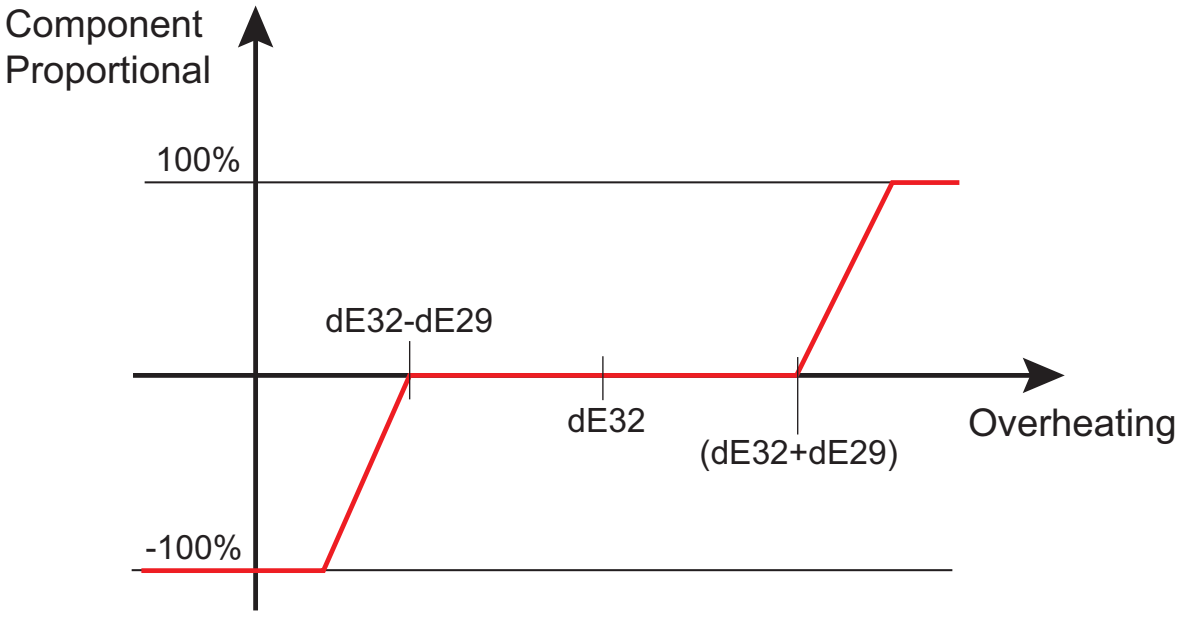
This algorithm is managed by the following dedicated parameters:

PAR.	Description	UM	Range	Default
dE26	Proportional control coefficient	°C/°F	0.1...999.9	50.0
dE27	Integral regulator gain	num	0...1999	10
dE28	Valve activation recalculation period	sec x0.2	1...1999	4
dE29	Control cut-in threshold	°C/°F	0.1...999.9	1.0
dE66	Maximum valve opening variation compared to previous period	%	0.1...100.0	3.0

Within the cut-in thresholds, **XVD** acts only on the integral part.



The proportional component is equal to 0% within the thresholds while it cuts in outside of these.



NOTE. The list below defines the type and operational logic for the driver PID control. These parameters must be checked and modified, if necessary, to customise the system operation.

The PID output value (Proportional-Integral-Derivative) is recalculated every (**dE28 * 0.2**) seconds.

This algorithm is used to synchronise (and therefore limit) the speed by which the PID varies synchronising it with the valve opening and closing speed. In fact it is possible to limit the maximum valve opening/closing speed between two subsequent recalculations using parameter **dE66**.

Below a PID control tuning methods is given as an example only, to be performed with a constant load:

1. Set a sufficiently high proportional band value;
2. Switch the device on and check the overheating progress:
    a. If it approaches the setpoint **dE32** very slowly, increase the integral regulator gain value (**dE27**) and repeat the step;
    b. If it goes way below the setpoint (**dE32**) and stays there for a significantly long time, reduce the integral regulator gain value (**dE27**) and repeat the step.
3. When the result of the previous step is sufficiently accurate, you can increase the system reactivity, reducing the proportional ban via the proportional control coefficient (**dE26**).

NOTE: the weight of the integral component of the algorithm increases as the value of **dE27** increases. (This function is opposite to what happens with the standard PID algorithm, where the integral time increasing reduces the weight of the integral part).

7.3. OVERHEATING SETPOINT FROM REMOTE

This function is used to change the overheating setpoint via Modbus by managing a temporary Setpoint register. This Setpoint value will be valid for the whole time in which the corresponding time-out is ≠ 0.

The management logic is as follows:

1. Write the overheating Setpoint value in the modbus address of the **Remote_Setp_Overheating**.
2. Write a timeout value (in seconds) in the modbus address of the **TimeOut_Remote_Setp_Overheating**.
3. Periodically update the timer value set in point 2.

When the timeout has expired, the **XVD** driver will upload the new Setpoint value (**dE32**).

7.4. dE21 PLANT TYPE

The PID configuration parameters are loaded automatically by the device selecting the type of system defined by the parameter **dE21**.

7.5. MOP (Maximum Operating Pressure)

MOP control has a threshold set by the pressure setpoint **dE52**.

Above this threshold for more than time **dE53**, a MOP alarm is triggered
(see **'CHAPTER 11' on page 71**):

- MOP control can be enabled using parameter **dE50**.
- MOP control can be disabled when the device is switched on/after a defrost condition for an amount of time equal to **dE51**. This allows the pressure to drop below a given level when the system is switched back on.

7.6. MOP SETPOINT FROM REMOTE

This function is used to change the MOP setpoint via Modbus by managing a temporary Setpoint register.
This Setpoint value will be valid for the whole time in which the corresponding time-out is ≠ 0.

The management logic is as follows:

1. Write the MOP setpoint value in the modbus address of the **Remote_Setp_MOP**.
2. Write a timeout value (in seconds) in the modbus address of the **TimeOut_Remote_Setp_MOP**.
3. Periodically update the timer value set in point 2.

When the timeout has expired, the **XVD** driver will upload the new Setpoint value.

7.7. XVD MANAGEMENT AS ACTUATOR

This function is used from remote, it is possible to use the driver as an actuator, sending the required opening percentage.

The management procedure is:

1. Enable the actuator mode flag by writing in the modbus address **EEV_STTS_FORCE_OPEN_SET**.
2. Set the required percentage, writing it in the modbus address **Remote_Percentage**.
3. Periodically update the timer value set in point 2.

The actuator management mode from remote can only be activated if:

- No digital input is configured as "100% open" (**DL40** ≠ ±7 and **DL41** ≠ ±7);
- Parameter **dF02** ≠ 0.

The actuator management mode from remote is disabled automatically if:

- The actuator mode flag is disabled, setting value 0 in the modbus address **EEV_STTS_FORCE_OPEN_SET**.
- More than 60 s have passed since the receipt of the last Modbus command.

7.8. VALVE ACTIVATION WITH FIXED PERCENTAGE

When the device enables the overheating control, it is possible to force the value for a limited period of time to a fixed percentage value.

To set the period of time in which the valve runs with a fixed percentage, set parameter **dE49** (in seconds). The percentage value the valve works at is fixed by setting parameter **dE11**.

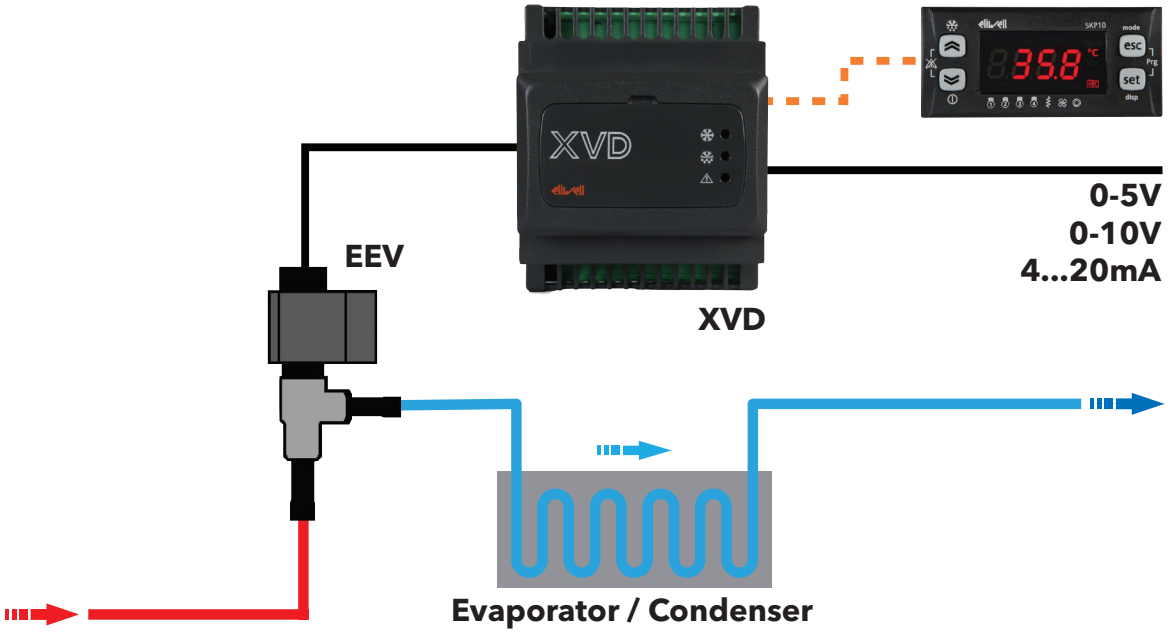
If dE11 = 0%, the device will force the valve to open to the previous percentage value.

CHAPTER 8
REGULATORS

8.1. “SINGLE ACTUATOR”

In the following example we can see that:

- The **XVD** driver controls the electronic expansion valve.
- The **XVD** driver has a 0-10 V / 4…20 mA input that translates a control signal from a step-step valve (stepper).



8.2. “STAND-ALONE”

The regulation can be controlled via:

1. digital inputs (using models **420H LAN**, **420H RS-485**, **420H Digital**).
2. serial connection (using models **420H LAN** and **420H RS-485**).

The **XVD** driver controls the electronic expansion valve and receives the commands “defrost” and “EEV control” from:

1. digital inputs (see **‘6.2. DIGITAL INPUTS’ on page 54**).
2. RS-485 serial.

To set parameter **dF02** see **‘8.2.1. CONTROL FROM DIGITAL INPUTS OR SERIAL’ on page 61**.

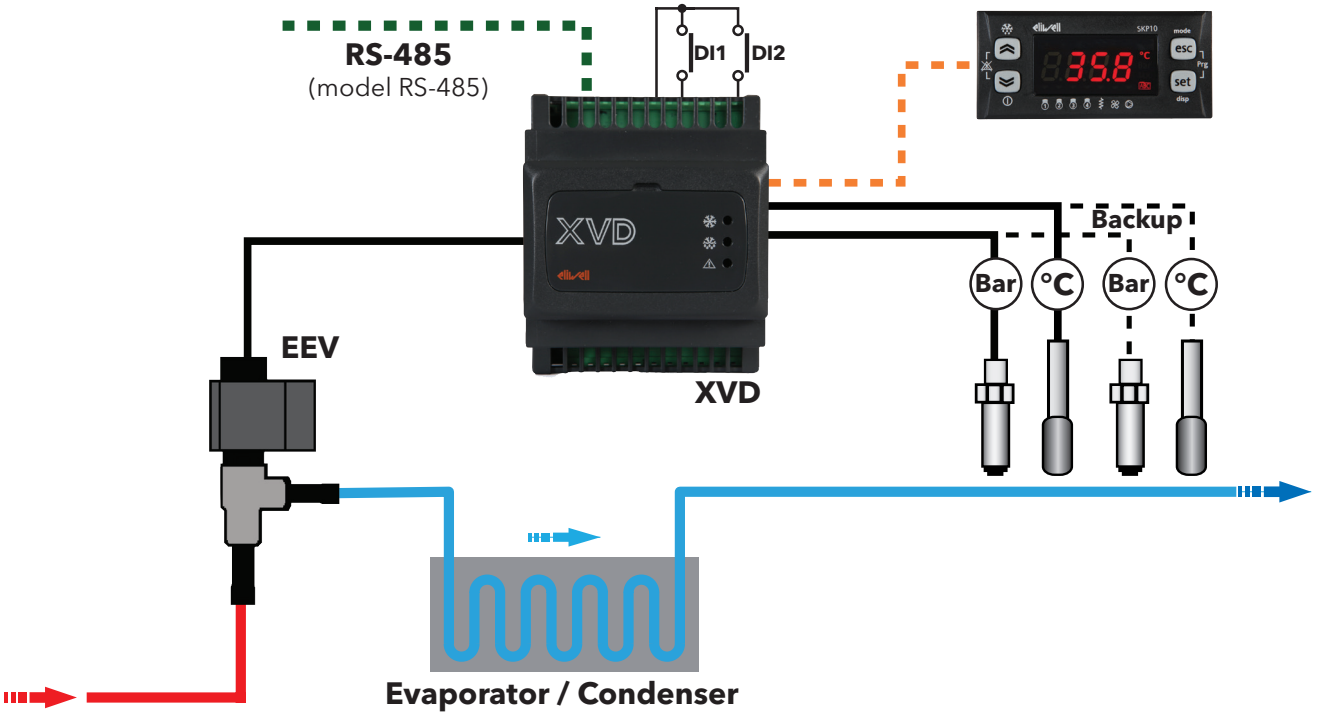
8.2.1. CONTROL FROM DIGITAL INPUTS OR SERIAL

The type of command depends on the setting of parameter **dF02**:

- if **dF02 = 0**: digital input;
- if **dF02 ≠ 0**: serial.

If the Digital inputs are configured to ≠ 0 they always have priority over the serial command independently of **dF02**. (see'CHAPTER 6' on page 52).

The Televis/Modbus protocol is selected using parameter **dF00**.



8.2.2. DIGITAL INPUT ADJUSTMENT

Value dL40/dL41			Notes
±1	ON	Enable adjustment	• if **dE11 = 0:** Forces the valve opening to the value used before the last OFF • if **dE11 ≠ 0:** Forces the valve opening to value **dE11** for a period of time set in **dE35**
	OFF	Disable adjustment	Valve closing (save the current percentage in **dE11**)
±2	ON	Defrost in progress	Valve closing The configured digital input **±1** is ignored until the end of defrost. At the end of defrost: • If **dE12** ≠ 0: the valve is forced open to the defined value (**dE12**). • Otherwise it will run according to **dE11.**
	OFF	No defrost	-
±3	ON	Alarm active	Valve closing.
	OFF	Alarm not active	-
±4	ON	Enable adjustment preset factory regulation	Control enabled with profile defined by: **dE22 - Type of system operating mode 1.**
	OFF		Control enabled with profile defined by: **dE21 - Type of system operating mode 0.**
±5	ON	Protocol setting for main serial communication di comunicazione della seriale principale	Modbus protocol with data parameters from **dF30, dF31, dF32.**
	OFF		The communication protocol is set by **dF00.**
±6	ON	Enable regulation	• if **dE11 = 0:** Forces the valve opening to the value used before the last OFF. • if **dE11 ≠ 0:** Forces the valve opening to value **dE11** for a period of time set in **dE35.**
	OFF	Deactivate regulation	Having saved the opening percentage: • closes the valve • closes the solenoid valve (if the driver is configured) • deactivates the valve regulator
±7	ON	Valve opening to 100%	The valve opening is forced at 100% whatever the opening of the other regulators, except if the alarms force the valve to close.
	OFF	The valve control returns to the current regulator valvola ripassa al regolatore corrente	The manual/automatic (bumpless) passage starts from a 100% valve opening.

8.2.3. RS-485 SERIAL REGULATION

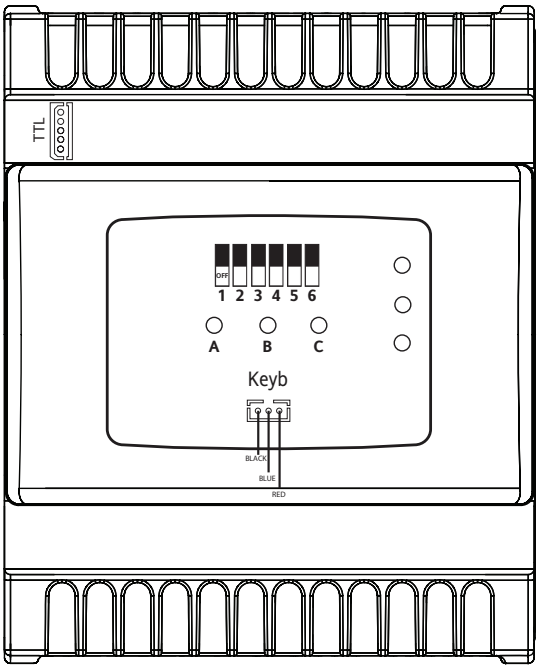
With an RS-485 serial it is possible to control the regulation from the serial in the same way described in **'6.2. DIGITAL INPUTS' on page 54**.

It is also possible to enable operating modes 2 and 3 (parameters **dE23** and **dE24**) which are not available for Digital inputs.

CHAPTER 9
MULTI FUNCTION KEY

9.1. INTRODUCTION

When connected to the Energy TTL serial port, the Multi Function Key (MFK) allows you to rapidly program device parameters (up/download parameter map to or from one or more devices of the same type) and/or the device application.



NOTE: To connect the MFK to the TTL serial port, use the yellow cable supplied.

The upload (label UL), download (label dL) and copy card formatting (label Fr) operations are performed as explained below:

UPLOAD (UL): Copy from the DEVICE to the MULTI FUNCTION KEY (MFK).
By doing this, the programming parameters and/or application will be loaded from FREE to the Multi Function Key.

DOWNLOAD (dL): Copy from the MULTI FUNCTION KEY (MFK) to the DEVICE.
By doing this, the programming parameters will be uploaded from the Multi Function Key to the instrument.

FORMAT* (Fr): Formatting the Multi Function Key consists of deleting its contents.
**This should be done prior to Uploading when used for the first time.*

There are two ways of using the MFK.

- Using the DIP switches (only Upload/Download)
- Via the **SKP 10** terminal

9.2. DIP-SWITCH LEDS

The LEDS A/B/C inside the door indicate the operating state.

LED	Colour	UPLOAD		
		Underway	Completed properly	Failed
A	Green	Flashing	On	On
B	Yellow	-	-	-
C	Green	-	-	Flashing
LED	**Colour**	**DOWNLOAD:**		
		Underway	**Completed properly**	**Failed**
A	Green	-	-	-
B	Yellow	Flashing	On	On
C	Green	-	-	Flashing

9.3. UPLOAD/DOWNLOAD VIA DIP-SWITCH

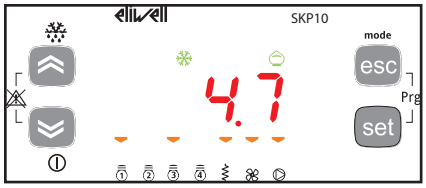
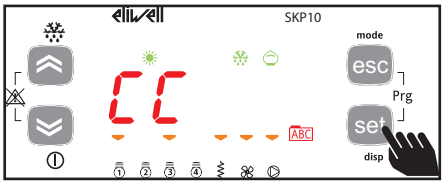
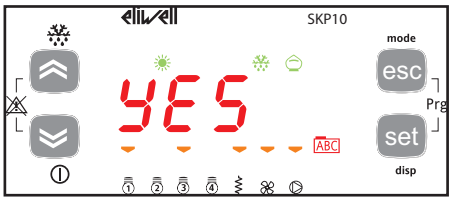
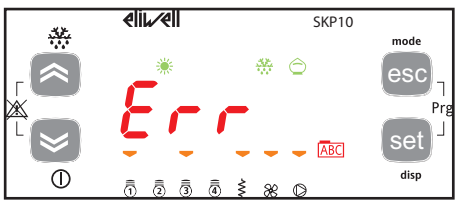
Proceed as follows:

1. insert the Multi Function Key (MFK) in the appropriate connector with the instrument switched on;
2. place the DIP switches 1 or 2 inside the door to “ON”, as described in the following table;
3. when the operation has been completed, remove the MFK;
4. return the DIP switch to “OFF”.

	DIP ->	1	2	3	4	5	6
Upload/Download parameters from MFK	Upload	ON	OFF	-	-	-	-
	DOWNLOAD:	OFF	ON	-	-	-	-

9.4. UPLOAD/DOWNLOAD VIA SKP 10

A step by step illustration of how to proceed is provided below:

Upload/Download/Format	
	From the main display press “esc” and “set” at the same time. The label ‘PAr’ will appear. Use “UP” and “DOWN” to view the label “FnC”. Press “set”. The CC label will appear.
	The commands you need to use the Multi Function Key are in the CC folder. Press “set” to access the functions.
	Scroll “UP” and “DOWN” to look for the function you want: • UL for upload; • dL for download; • Fr for format. Press “set” to upload or download (in the example dL- download). Wait for a few seconds.
	If the operation is successful, the display shows “YES”.
	If the command is NOT successful, the display shows “Err”.

9.5. DOWNLOAD FROM MFK

Connect the key with the device switched off.

FIRMWARE DOWNLOAD

At start up, if a compatible firmware is loaded into the MULTI FUNCTION KEY (MFK) a compatible firmware (saved in the MKF with the Device Manager software), the new firmware is downloaded into the device.

This happens as follows:

- firmware verification/update (MFK LED flashing)
- termination with successful programming (MFK LED on fixed);
- device switch off.

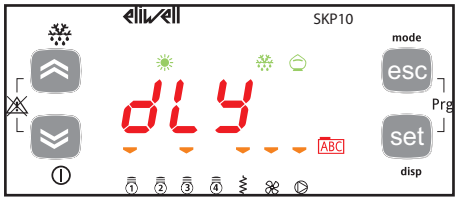
NOTE: if there is no compatible firmware in the MFK no firmware can be downloaded.

If, on termination, the MFK led does not stay on fixed, the operation must be repeated as this means it failed.

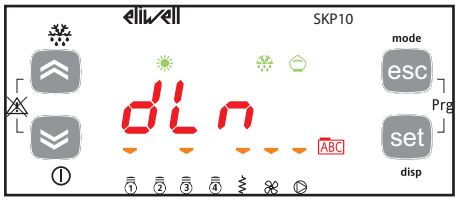
DOWNLOAD FROM RESET

On start up, if there is a compatible parameter map in the MFK, the programming parameters are loaded into the device.

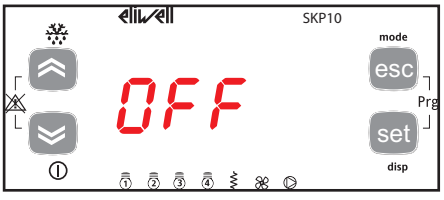
Download from reset



Example A
after the lamp test, the display shows **dLY**.
If the procedure was completed successfully.



Example B
after the lamp test, the display shows **dLn**
Completion of the procedure was unsuccessful (°).



In both cases, the instrument will be switched OFF locally. (OFF appears on the display).

Press “DOWN” (see **‘6.2. DIGITAL INPUTS’ on page 54**) the controller will operate:

- with the new map **Example A**;
- with the previous map **Example B**.

Remove the MFK on completion.

NOTES:

- If the Multi Function Key (MFK) is loaded with both a compatible firmware and a compatible parameter map, the firmware is downloaded first and then (after the device has been switched off and back on again manually) the parameter map.
- The formatting function is ONLY REQUIRED FOR UPLOADING **.
  - to use the Multi Function Key the first time;
  - to use the Multi Function Key with models that are not compatible.

** *a pre-programmed card supplied by Eliwell to DOWNLOAD parameters does not need to be formatted.*

Formatting **CANNOT** be undone.

- After the download operation, the instrument will work with the newly loaded parameters map/firmware.
- Remove the key on completion of the operation.

(°) If the string Err / dLn (download from reset) appears*:*

- verify that the key is connected to the device;
- verify the Multi Function Key – XVD connection (TTL cable);
- verify that the key is compatible with the device;
- contact the Eliwell Technical Support.

CHAPTER 10
SUPERVISION

The serial TTL can be used to configure the device, parameters, states, and variables with Modbus via the Modbus protocol.

10.1. CONFIGURATION WITH MODBUS RTU

Modbus is a client/server protocol for communication between devices connected in a network.

Modbus devices communicate using a master-slave technique in which only one device (master) can send messages. The other devices in the network (slave) respond, returning the data requested by the master or executing the action contained in the message sent. A slave is a device connected to a network that processes information and sends the results to the master using the Modbus protocol.

The master device can send messages to individual slaves or to the entire network (broadcast) whilst slaves can only respond individually to the master.

The Modbus standard used by Eliwell employs the RTU code for data transmission.

10.2. DATA FORMAT (RTU)

The coding model used defines the structure of messages transmitted on the network and the way in which this information is deciphered. The coding type is usually chosen according to specific parameters (baud rate, parity, etc.)*. Some devices also support only certain coding models. However this must be the same for all devices connected to a modbus network.

The protocol uses the RTU binary method with bytes configured as follows:

- **8 bit** for data
- **1 parity bit even** (non configurable)
- **1 bit** for stop.

** The values can be set in parameters **dF30** and **dF31**.*

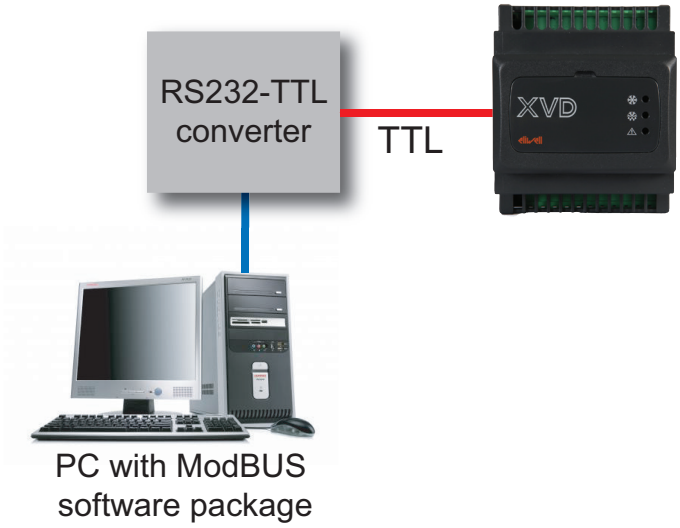
Parameter setting allows the integral configuration of the device.

The parameters can be modified via:

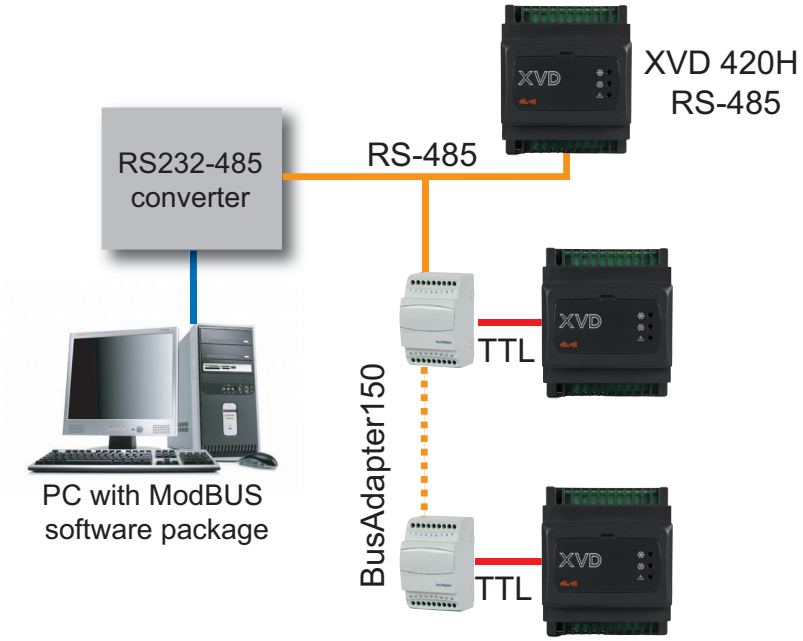
- **SKP 10** terminal
- Multi Function key (MFK)
- Sending data via ModBUS protocol directly to an individual controller or broadcasting it using the address 0.

Refer to the following connection diagram when using Modbus.

EXAMPLE 1: ModBus connection to individual devices via TTL



EXAMPLE 2: ModBus connection to multiple devices via RS-485



PC connection / Interface	Cable RS232
Device / Bus Adapter connection	5-way TTL connector cable (30 cm - 11.81 in.) (other sizes and lengths available)
BusAdapter 150	TTL / RS485 converter for devices without RS485 port
BusAdapter / Interface connection	Shielded and twisted RS-485 cable (for example: Belden model 8762)

Modbus commands available and data areas

Modbus command	Command description	
3	Read multiple registers on Client side	
16	Write multiple registers on Client side	
43	0	Manufacturer ID
	1	Model ID
	2	Instrument ID

Maximum length in bytes of messages sent to device	60 BYTE
Maximum length in bytes of messages received by the device	60 BYTE

10.3. DEVICE ADDRESS CONFIGURATION

The address of a device (Device Number) in a ModBus message is defined in parameter **dF30**.
See **'PARAMETERS (PAr)' on page 73**.

The address 0 is used for broadcast messages that all slaves recognise. Slaves don't respond to broadcast messages.

10.4. PARAMETER ADDRESS CONFIGURATION

For the list of addresses, refer to **'12.1. PARAMETERS/ VISIBILITY' on page 75**.

10.5. CONFIGURATION OF VARIABLE ADDRESSES/STATES

For the list of addresses, refer to **'12.6. CLIENT TABLE' on page 94**.

CHAPTER 11
ALARMS

XVD can run integral diagnostics on the installation, signalling any operating faults with specific alarms found, and record and signal any user-defined unusual events to have greater control over the installation as a whole.

The alarm condition is always reported by the LED near the alarm icon and the enabling of the output on the relay, if appropriately configured.

The probe error is shown directly on the **SKP 10** terminal display.
See **'6.2. DIGITAL INPUTS' on page 54**.

11.1. ALARMS TABLE

Label	Description/Cause*	Effect	Reset	Solution
Er01	**Probe Ai1 in error** • Measured values are outside operating range. • Probe inoperable/shortcircuited/ open.	If **dL30** = 0...4: • Only reported if it does not involve an alarm **Er05** or **Er06** (see below) • Otherwise as described for **Er05** or **Er06** (see below). If **dL30** = 5: • Valve closed.	A	• Verify the probe wiring. • Replace probe. • When error has been removed, regulation continues as normal.
Er02	**Probe Ai2 in error** • Measured values are outside operating range. • Probe inoperable/shortcircuited/ open.	If **dL31** = 0...4: • Only reported if it does not involve an alarm **Er05** or **Er06** (see below) • Otherwise as described for **Er05** or **Er06** (see below). If **dL31** = 5: • Valve closed.	A	Same as **Er01**.
Er03	**Probe Ai3 in error** • Measured values are outside operating range. • Probe inoperable/shortcircuited/ open.	• Only reported if it does not involve an alarm **Er05** or **Er06** (see below) • Otherwise as described for **Er05** or **Er06** (see below).	A	Same as **Er01**.
Er04	**Probe Ai4 in error** • Measured values are outside operating range. • Probe inoperable/shortcircuited/ open.	• Only reported if it does not involve an alarm **Er05** or **Er06** (see below) • Otherwise as described for **Er05** or **Er06** (see below).	A	Same as **Er01**.
Er05	**Evaporator output probe error.** The probes AI3 and AI4 are faulty.	% valve opening (**dE16**).	A	Same as **Er01**.
Er06	**Saturation output error.** The probes AI1 and AI2 are faulty.	• **Example dE50=0** % valve opening (**dE16**). • **Example dE50=1** Valve closed.	A	Same as **Er01**.

Label	Description/Cause*	Effect	Reset	Solution
Er07	**MOP alarm.** Saturation temperature > MOP setpoint (**dE52**) for longer than **dE53**.	Valid only if **dE50** = 1. Valve closed.	A	Wait for saturation temperature to return < **dE52**.
Er08	% maximum valve opening drE7 ≥ **dE10** for longer than dE13.	Report only.	A	Wait for return % of maximum valve opening drE7 < **dE10**.
Er09	**External alarm.** Activation of digital input configured as external alarm. See parameters dL40/dL41=±3.	Valve closed.	A	Deactivation of digital input configured as external alarm.
Er10	**NO link alarm.** Serial communication failed. (dF02=1, 2)	Valve closed.	A	Restore communication.
Er11	**Motor protection alarm.** Excessive current absorption.	Valve closed.	A	• Verify motor phases. • Verify motor connection.
Er12	**Motor protection alarm.** Winder 1 disconnected.	Valve closed.	A	• Verify winding 1 connection (terminals 6-7). • Verify correct parameter settings **dE01**...**dE09**, **dE80**.
Er13	**Motor protection alarm.** Winder 1 short circuit.	Valve closed.	A	• Verify winding 1 connection (terminals 6-7). • Verify correct parameter settings **dE01**...**dE09**, **dE80**.
Er14	**Motor protection alarm.** Winder 2 disconnected.	Valve closed.	A	• Verify winding 2 connection (terminals 4-5). • Verify correct parameter settings **dE01**...**dE09**, **dE80**.
Er15	**Motor protection alarm.** Winding 2 short-circuited.	Valve closed.	A	• Verify winding 2 connection (terminals 4-5). • Verify correct parameter settings **dE01**...**dE09**, **dE80**.

Reset: A = automatic reset. If the cause of the error is removed, the device deletes the error.

(*) factory settings.

CHAPTER 12
PARAMETERS (PAr)

The parameters are used to configure the **XVD** driver:

They can be modified with:

- Multi Function key (MFK)
- Terminal **SKP 10**;
- Computer with Device Manager software

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

After editing the BIOS parameters the device must be switched off and on again.

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

TABLES

The following tables list all the information required to read, write and decode all the accessible resources in the device.

COLUMN DESCRIPTION

Column	Description
FOLDER	Indicates the label of the folder containing the parameter in question.
LABEL	Indicates the label used to display the parameters in the menu of the device.
PAR VAL ADDRESS	Indicates the address of the Modbus register containing the resource to be accessed.
PAR VIS ADDRESS	Indicates the address of the Modbus register containing the parameter visibility. By default all parameters have: • Data size = 2 bit • Range = 0…3 (see **"VISIBILITY OF PARAMETERS" page 75**) • UM = num
R/W	Indicates whether the resources are read/write, read only or write only: • R = Read only resource • W = Write only resource • RW = Read/write resource
RESET	Indicates if the parameter modification requires the device to be reset. • Y = YES, reset required • N = NO, reset not required
DESCRIPTION	Description of the parameter function
DATA SIZE	Indicates the size of the parameter data: • BYTE = 8 bit • WORD = 16 bit • "n" bit = 0...15 bit based on value of "n"
CPL	When the field indicates "Y" the value read by the register needs to be converted because the value represents a number with a sign. In the other cases the value is positive or null. To run the conversion, proceed as follows: • If the value in the register is between 0 and 32,767, the result is the value itself (zero and positive values). • If the value in the register is between 32,768 and 65,535, the result is the value of the register – 65,536 (negative values).
EXP	If the field shows -1 the value read by the register is divided by 10 (value/10) to convert it to the values indicated in the RANGE and DEFAULT columns using the unit of measurement in the UM column. Example: parameter **CL04** = 50.0. Column EXP = -1: • The value read by the device is 50.0 • The value read by the register is 500 → 500/10 = 50.0
RANGE	Describes the interval of values that can be assigned to the parameter. It can be correlated with other parameters in the device (indicated with the parameter label). **NOTE**: If the value is beyond the specified limits for the parameter, instead of the effective value, the non-respected limit value is shown.
DEFAULT	Indicates the (default) setting for the reference code of the device. For parameters, the column is divided into the number of models issued as the defaults change.
UM	Unit of measurement for values converted according to the rules indicated in the CPL and EXP columns.

VISIBILITY OF PARAMETERS

According to the reference code, some configuration parameters many not be visible and/or many have no meaning as the associated resource is not present.

It is possible to configure four levels of visibility, assigning appropriate values to parameters and folders:

Value	Visibility level	Password
3	Visible parameters or folders.	No password required.
2	Manufacturer level. It is possible to view these parameters or folders only by entering the password defined in parameter **UI28**. All parameters specified as visible and parameters visible at the installer level will be visible.	The password-protected objects are visible only if the correct password is entered (installer or manufacturer) using the password entry procedure (see **"5.8. SETTING THE PASSWORD (PAr/ PASS)" page 51**).
1	Manufacturer level. It is possible to view these parameters or folders only by entering the password defined in parameter **UI27**. All parameters specified as always visible and parameters visible at the installer level will be visible.	
0	Parameter or folders NOT visible.	N/A

Unless otherwise indicated, the parameter is visible and can be modified, unless custom settings are configured via the serial port.

It is possible to verify the visibility of parameters and folders. Consult the folders table (see **"12.5. FOLDER VISIBILITY TABLE" page 93**).

When modifying the visibility of the folder, the new setting applies to all parameters in the folder.

12.1. PARAMETERS/ VISIBILITY

The following sections analyse each parameter, divided into categories (folders):

Folder label	Meaning of acronym (label)	Parameters
dF	driver protocol configuration	Protocol Configuration
dL	driver Locator configuration	I/O configuration
dE	driver valve configuration	Valve configuration
Ui	User interface	User interface

FOLDER	LABEL	ADDRESS PAR VAL	ADDRESS PAR VIS	R/W	RESET	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	MODEL				UM
											XVD 420H LAN	XVD 420H RS-485	XVD 420H DIGITAL	XVD 100H ACTUATOR	
Protocol configuration (folder "dF")															
dF	dF00	49158	49434.6	RW	N	Select COM0 protocol: • **0** = Eliwell • **1** = Modbus • **2** = NOT USED. • **3** = NOT USED.	BYTE	-	-	0...3		1	1	1	num
dF	dF02	49200	49435.2	RW	N	Control from digital inputs or serial port: • **0** = digital input • **1** = LAN / RS-485 (models RS-485 and LAN) • **2***= LAN / RS-485 + shared probe (models RS-485 and LAN) • **3***= digital input + shared probe (*) shared probe refers to a value written via serial to dedicated addresses, for the temperature/ pressure probes configured but not connected. **NOTE**: If **dL40**≠0 and/or **dL41**≠0 the control comes from the serial. The Digital inputs DI1, DI2 (if configured **≠0**) will ALWAYS have priority over commands received from the serial.	BYTE	-	-	0...3	1	1	0		num
dF	dF20	49172	49437.0	RW	N	Eliwell protocol controller address **NOTE**: The pair of values **dF20** and **dF21** represent the network address of the device and is indicated in the following format "FF.DD". (where FF=dF21 and DD=dF20).	BYTE	-	-	0...14	0	0	0	0	num
dF	dF21	49173	49437.2	RW	N	Eliwell protocol controller family. See NOTE **dF20**.	BYTE	-	-	0...14	0	0	0	0	num
dF	dF30	49175	49437.6	RW	Y	Modbus protocol controller address	BYTE	-	-	0...255	1	1	1	1	num
dF	dF31	49176	49438.0	RW	Y	Modbus baud rate protocol: • **0** = 1200 baud • **1** = 2400 baud • **2** = 4800 baud • **3** = 9600 baud • **4** = 19200 baud • **5** = 38400* baud • **6** = 57600 baud • **7** = 115200 baud **(*)**: Maximum speed that can be set with Device Manager.	BYTE	-	-	0...7	3	3	3	3	num
dF	dF32	49177	49438.2	RW	Y	Modbus parity protocol: • **0** = NONE • **1** = EVEN • **2** = ODD	BYTE	-	-	0...2	1	1	1	1	num
dF	dF60	16426	49440.0	RW	N	Customer code 1.	WORD	-	-	0...999	0	0	0	0	num

FOLDER	LABEL	ADDRESS PAR VAL	ADDRESS PAR VIS	R/W	RESET	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	MODEL				UM
											XVD 420H LAN	XVD 420H RS-485	XVD 420H DIGITAL	XVD 100H ACTUATOR	
dF	dF61	16428	49440.2	RW	N	Customer code 2.	WORD	-	-	0...999	0	0	0	0	num
I/O configuration (**Folder "dL"**)															
dL	dL00	50894	49429.2	RW	Y	Analogue input AI1 type: • **0** = Probe not configured • **1** = NTC • **2** = Pt1000 • **3** = 4...20 mA • **4** = Ratiometric 0-5 V • **5** = 0-10 V • **6** = NTC extended	BYTE	-	-	0...6	3	3	3	3	num
dL	dL01	50895	49429.4	RW	Y	Analogue input AI2 type. Same as **dL00**.	BYTE	-	-	0...6	3	3	3		num
dL	dL02	50896	49429.6	RW	Y	Analogue input AI3 type: • **0** = Probe not configured • **1** = NTC • **2** = Pt1000 • **3** = NOT USED • **4** = NOT USED • **5** = NOT USED; • **6** = NTC extended	BYTE	-	-	0...6	1	1	1		num
dL	dL03	50897	49430.0	RW	Y	Analogue input AI4 type. Same as **dL02**.	BYTE	-	-	0...6	1	1	1		num
dL	dL08	50923	49430.2	RW	N	°C/°F selection: **0** = °C; **1** = °F	BYTE	-	-	0...1	0	0	0	0	flag
dL	dL09	50924	49430.4	RW	N	Pressure unit of measure: **0** = bar; **1** = psi	BYTE	-	-	0...1	0	0	0	0	flag
dL	dL10	18130	49430.6	RW	N	Analogue input AI1 fullscale value.	WORD	Y	-1	dL11...9999	7.0	7.0	7.0	7.0	bar/psi
dL	dL11	18140	49431.0	RW	N	Analogue input AI1 start of scale value.	WORD	Y	-1	-145...dL10	-0.5	-0.5	-0.5	-0.5	bar/psi
dL	dL12	18132	49431.2	RW	N	Analogue input AI2 fullscale value.	WORD	Y	-1	dL13...9999	7.0	7.0	7.0		bar/psi
dL	dL13	18142	49431.4	RW	N	Analogue input AI2 start of scale value.	WORD	Y	-1	-145...dL12	-0.5	-0.5	-0.5		bar/psi
dL	dL20	50918	49431.6	RW	Y	Analogue input AI1 differential.	BYTE	Y	-1	-120...120	0	0	0	0	bar/psi °C/°F
dL	dL21	50919	49432.0	RW	Y	Analogue input AI2 differential.	BYTE	Y	-1	-120...120	0	0	0		bar/psi °C/°F
dL	dL22	50920	49432.2	RW	Y	Analogue input AI3 differential.	BYTE	Y	-1	-120...120	0	0	0		°C/°F
dL	dL23	50921	49432.4	RW	Y	Analogue input AI4 differential.	BYTE	Y	-1	-120...120	0	0	0		°C/°F
dL	dL30	50934	49432.6	RW	N	Analogue input AI1 config.: • **0** = disabled • **1** = evaporator output (overheating) • **2** = saturation • **3** = backup evaporator output (overheating) • **4** = backup saturation • **5** = valve opening direct control	BYTE	-	-	0...5	2	2	2	2	num
dL	dL31	50935	49433.0	RW	N	Analogue input AI2 config. Same as **dL30**.	BYTE	-	-	0...5	4	4	4		num

FOLDER	LABEL	ADDRESS PAR VAL	ADDRESS PAR VIS	R/W	RESET	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	MODEL				UM
											XVD 420H LAN	XVD 420H RS-485	XVD 420H DIGITAL	XVD 100H ACTUATOR	
dL	dL32	50936	49433.2	RW	N	Analogue input AI3 config. • **0** = disabled • **1** = evaporator output (overheating) • **2** = saturation • **3** = backup evaporator output (overheating) • **4** = backup saturation	BYTE	-	-	0...4	1	1	1		num
dL	dL33	50937	49433.4	RW	N	Analogue input AI4 config. Same as **dL32**.	BYTE	-	-	0...4	3	3	3		num
dL	dL40	50926	49433.6	RW	Y	Digital input DI1 config. • **0** = digital input not configured • **±1** = ON/OFF adjustment • **±2** = defrost • **±3** = alarm • **±4** = system operating mode (only mode **0** and **1**) • **±5** = main serial communication protocol • **±6** = ON/OFF regulation with delay (OFF = 50 % valve opening for 40 s) • **±7** = complete valve opening	BYTE	Y	-	-7...7	0	0	1		num
dL	dL41	50927	49434.0	RW	Y	Digital input DI2 config. Same as **dL40**.	BYTE	Y	-	-7...7	5	0	2		num
dL	dL90	50940	49434.2	RW	Y	Digital output DO1 configuration. • **0** = output controlled from serial • **±1** = solenoid valve control • **±2** = alarm output	BYTE	Y	-	-2...2	0	0	0	0	num
dL	dL91	50941	49434.4	RW	Y	Digital output DO2 configuration (OC). Same as **dL90**.	BYTE	Y	-	-2...2	0	0	0		num
Valve configuration (folder “dE”)															
dE	dE00	49201	49442.0	RW	Y	• **0** = Customizable • **1** = DANFOSS ETS-50 • **2** = DANFOSS ETS-100 • **3** = ALCO EX4/EX5/EX6 • **4** = NOT CONFIGURED • **5** = ALCO EX7 • **6** = ALCO EX8 • **7** = NOT CONFIGURED • **8** = SPORLAN SER • **9** = SPORLAN SEI-30 • **10** = SPORLAN SEI-50, SEH • **11** = NOT CONFIGURED • **12** = SPORLAN SER (I) B/ C/ D/ G/ J/ K. • **13** = ELIWELL by Schneider Electric SXVB261●●●●●● (body 1) • **14** = ELIWELL by Schneider Electric SXVB264●●●●●● (body 4) • **15** = ELIWELL by Schneider Electric SXVB262●●●●●● (body 2)/ SXVB263●●●●●● (body 3)	BYTE	-	-	0...15	1	1	1	1	num

FOLDER	LABEL	ADDRESS PAR VAL	ADDRESS PAR VIS	R/W	RESET	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	MODEL				UM
											XVD 420H LAN	XVD 420H RS-485	XVD 420H DIGITAL	XVD 100H ACTUATOR	
Parameters dE01…dE09/dE80...dE82 are visible and settable from the keyboard only if **dE00** = 0. For the description of parameters dE01...dE09, dE80...dE82, see: • **'12.2. VALVE CONFIGURATION PARAMETERS' on page 83.** • **'12.3. VALVE CONFIGURATION PARAMETERS WITH dE00 = 0' on page 83.** • **'12.4. VALVE CONFIGURATION PARAMETERS WITH dE00 ≠ 0' on page 85.**															
dE	dE10	49208	49442.2	RW	N	**Maximum valve opening percentage**. Defines the maximum valve opening value, meaning the actuation limits in percentages. **dE10 = 0** indicates that the valve is completely closed.	BYTE	-	-	0...100	100	100	100	100	%
dE	dE11	49209	49442.4	RW	N	**Valve actuation percentage after blackout.** Value calculated automatically but settable using this parameter for first start-up.	BYTE	-	-	0...100	0	0	0	0	%
dE	dE12	49210	49442.6	RW	N	**Valve actuation percentage after defrost.** Value calculated automatically but settable using this parameter for first start-up. If **dE12**=0 the percentage is defined by **dE11**.	BYTE	-	-	0...100	0	0	0	0	%
dE	dE13	49211	49443.0	RW	N	**Operating time at max opening for alarm signal**. If the valve opening remains at a value of greater than **dE10** for the time set by **dE13** a maximum opening alarm will be given by **dA07** (see **'CHAPTER 11' on page 71.**). If **dE13**=0 signal disabled.	BYTE	-	-	0...255	60	60	60	60	min
dE	dE14	49212	49443.2	RW	N	**Minimum useful valve opening percentage.** If the regulator commands an output with value ≤ a **dE14**, the actual output = 0.	BYTE	-	-	0...dE15	0	0	0	0	%
dE	dE15	49213	49443.4	RW	N	**Maximum valve useful opening percentage.** If the regulator commands an output with value ≥ a **dE15**, the actual output will be **dE10** (with **dE15** < **dE10**). Ignored if **dE15** > **dE10**	BYTE	-	-	dL14...dL10	100	100	100	100	%
dE	dE16	49214	49443.6	RW	N	**Valve opening percentage during probe error.** If a probe error sets the valve opening, in percentage, for a time **dE13**.	BYTE	-	-	0...100	0	0	0	0	%
dE	dE19	49222	49444	RW	N	**Tolerance on stepper motor winding resistance.**	BYTE	-	-	0...255	65	65	65	65	%

FOLDER	LABEL	ADDRESS PAR VAL	ADDRESS PAR VIS	R/W	RESET	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	MODEL				UM
											XVD 420H LAN	XVD 420H RS-485	XVD 420H DIGITAL	XVD 100H ACTUATOR	
dE	dE93	49231	49444.2	RW	N	**Motor activation/disabling time** Sets the enabling/disabling cycles (Duty cycle) of the stepper motor. See **dE08**	BYTE	-	-	0...255	10	10	10	10	s*10
dE	dE20	49215	49444.4	RW	N	**Select type of gas** Use only if Dip Switch is set to 7. Otherwise it will be ignored. • **0** = R404A • **1** = R448A • **2** = R410A • **3** = R134a • **4** = R744 (CO_2) • **5** = R407C • **6** = R427A • **7** = customizable (default R290)	BYTE	-	-	0...7	2	2	2	2	num
dE	dE21	49216	49444.6	RW	N	Type of system operating mode 0 • **0** = User Setting • **1** = ducted refrigeration unit and evaporation pressure quickly modifiable (e.g. step control) • **2** = ducted refrigeration unit and evaporation pressure controlled (e.g. INVERTER control) • **3** = refrigeration unit with on-board compressor • **4** = refrigeration unit with on-board compressor and renewing exchanger • **5** = NOT USED • **6** = NOT USED • **7** = conditioning unit with plate exchanger • **8** = conditioning unit with shell and tube exchanger • **9** = conditioning unit with ribbed battery exchanger • **10** = conditioning unit with variable refrigerating capacity • **11** = perturbed conditioning unit • **12**…**16** = NOT USED	BYTE	-	-	0...16	0	0	0	0	num
dE	dE22	49225	49445.0	RW	N	Type of system operating mode 1. Same as **dE02**.	BYTE	-	-	0...16	0	0	0	0	num
dE	dE23	49226	49445.2	RW	N	Type of system operating mode 2. Same as **dE02**.	BYTE	-	-	0...16	0	0	0	0	num
dE	dE24	49227	49445.4	RW	N	Type of system operating mode 3. Same as **dE02**.	BYTE	-	-	0...16	0	0	0	0	num
dE	dE25	16492	49448.0	RW	N	Type of setting. **0** = PID linear regulation **1** = non linear threshold regulation	WORD	-	-	0...1	0	0	0	0	num

FOLDER	LABEL	ADDRESS PAR VAL	ADDRESS PAR VIS	R/W	RESET	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	MODEL				UM
											XVD 420H LAN	XVD 420H RS-485	XVD 420H DIGITAL	XVD 100H ACTUATOR	
dE	dE26	16524	49448.2	RW	N	Proportional control coefficient. **0.1** = maximum gain **999.9** = minimum gain	WORD	-	-	0.1...999.9	50.0	50.0	50.0	50.0	°C/°F
dE	dE27	16548	49448.4	RW	N	Integral regulator gain.	WORD	-	-	0...1999	2	2	2	2	num
dE	dE28	16550	49448.6	RW	N	Valve activation recalculation period.	WORD	-	-	1...1999	2	2	2	2	s/10
dE	dE29	16552	49449.0	RW	N	Control cut-in threshold: **- Err* > dE29**: proportional + integral regulation. **- Err* < dE29**: integral regulation only. *(*) **Err** understood as absolute value*	WORD	-	-	0.1...999.9	0.5	0.5	0.5	0.5	°C/°F
dE	dE30	49308	49445.6	RW	N	**Enable overheating recalculation reference.** Used to enable the automatic recalculation of the referred Setpoint in order to regulate the overheating. **0** = recalculation disabled and setpoint equal to **dE31**; **1** = automatic recalculation enabled.	BYTE	-	-	0...1	0	0	0	0	flag
dE	dE31	16512	49446.0	RW	N	**Overheating upper threshold** Used to set the setpoint SP4 at **dE31** (SP2) to regulate the overheating following a black-out or at the end of defrost. Active for the time set by **dE51** (or when the MOP function is disabled).	WORD	-	-1	0...1000	5.0	5.0	5.0	5.0	°C/°F
dE	dE32	16510	49446.2	RW	N	**Overheating lower threshold** Used to set the setpoint SP2 to regulate the overheating (objective overheating). If **dE30**=1 and the calculated Setpoint < **dE32**, the dynamic setpoint value will be = **dE32**.	WORD	-	-1	0...1000	5.0	5.0	5.0	5.0	°C/°F
dE	dE33	16514	49446.4	RW	N	**Overheating reference recalculation period** (if **dE30** = 1) Defines the recalculation period of the dynamic setpoint (every **dE33** seconds).	WORD	-	-	0...999	20	20	20	20	s
dE	dE34	16516	49446.6	RW	N	**Overheating recalculation step** Dynamic setpoint varies by **dE34** degrees according to the overheating value compared to **dE32**.	WORD	-	-1	0 ... 1000	0.1	0.1	0.1	0.1	°C/°F
dE	dE35	16470	49447.0	RW	N	Valve opening freezing timer after OFF → ON.	WORD	-	-	0 ... 1999	0	0	0	0	s
dE	dE36	16518	49447.2	RW	N	Overheating proportional band.	WORD	Y	-1	-9999 ... -1	-100	-100	-100	-100	K
dE	dE37	16520	49447.4	RW	N	Overheating integral time.	WORD	-	-	0 ... 1999	40	40	40	40	s
dE	dE38	16522	49447.6	RW	N	Overheating derivative time.	WORD	-	-	0 ... 1999	0	0	0	0	s

FOLDER	LABEL	ADDRESS PAR VAL	ADDRESS PAR VIS	R/W	RESET	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	MODEL				UM
											XVD 420H LAN	XVD 420H RS-485	XVD 420H DIGITAL	XVD 100H ACTUATOR	
dE	dE47	49329	49450.0	RW	N	**Enable valve manual opening** **0** = automatic valve opening **1** = manual valve opening	BYTE	-	-	0...1	0	0	0	0	flag
dE	dE48	16546	49450,2	RW	N	**Manual valve opening** (only if **dE47**=1) Valve opening switched from automatic to manual (**dE47**=1), the opening percentage is not 0% as per default parameter but the percentage indicated by **dE48**.	WORD	-	-1	0...1000	0	0	0	0	%
dE	dE49	49312	49449.2	RW	N	Overheating minimum percentage activation time.	BYTE	-	-	0...255	0	0	0	0	s
dE	dE50	49270	49450,4	RW	N	**Enable MOP** **0** = MOP disabled **1** = MOP enabled.	BYTE	-	-	0...1	0	0	0	0	flag
dE	dE51	16478	49450,6	RW	N	**MOP disable time at start-up.** MOP activation delay on switching on or after defrost.	WORD	-	-	0...999	0	0	0	0	s
dE	dE52	16472	49451	RW	N	MOP setpoint. Evaporator temperature upper threshold	WORD	Y	-1	-600...1000	0.0	0.0	0.0	0.0	°C/°F
dE	dE53	49271	49451,2	RW	N	Min time that temperature upper threshold is exceeded for alarm activation If the **dE52** threshold is exceeded for more than the time set in **dE53** the MOP alarm is given.	BYTE	-	-	0...255	180	180	180	180	s
dE	dE66	16494	49454.0	RW	N	Maximum valve opening variation compared to previous period.	WORD	-	-1	1...1000	2.0	2.0	2.0	2.0	%/s
User Interface (folder "Ui")															
Ui	Ui27	17988	49458,6	RW	N	Installation engineer password	WORD	-	-	0...255	1	1	1	1	num
Ui	Ui28	17990	49459.0	RW	N	Manufacturer password	WORD	-	-	0...255	2	2	2	2	num

12.2. VALVE CONFIGURATION PARAMETERS

dE00	Type of VALVE	dE01 (steps/s)	dE02 (steps)	dE03 (steps)	dE04 (mA)	dE05 (Ohm)	dE06 (mA)	dE07 (num)	dE08 (%)	dE09 (10*msec/step)	dE80 (steps/s)	dE81 (ms)	dE82 (steps/10)
0	Customisable	35	415	100	-200	35	50	0	100	50	10	125	0
1	DANFOSS ETS 50	160	2625	160	100	52	75	0	100	50	15	0	0
2	DANFOSS ETS 100	300	3530	160	100	52	75	0	100	50	10	0	0
3	ALCO EX4/EX5/EX6	500	750	100	500	13	100	0	100	50	10	0	0
4	NOT CONFIGURED	-	-	-	-	-	-	-	-	-	-	-	-
5	ALCO EX7	210	1600	100	750	8	250	0	100	50	10	0	0
6	ALCO EX8	500	2600	100	800	6	500	0	100	50	10	0	0
7	NOT CONFIGURED	-	-	-	-	-	-	-	-	-	-	-	-
8	SPORLAN SER	200	1596	100	120	100	50	0	100	50	10	25	100
9	SPORLAN SEI-30	200	3193	100	160	75	50	0	100	50	10	25	100
10	SPORLAN SEI-50, SEH	200	6386	100	160	75	50	0	100	50	10	25	100
11	NOT CONFIGURED	-	-	-	-	-	-	-	-	-	-	-	-
12	SPORLAN SER(I) B/ C/ D/ G/ J/ K/	160	2500	100	120	100	50	0	100	255	12	25	100
13	ELIWELL by Schneider Electric SXVB261●●●●●● (body 1)	35	415	100	-200	35	50	0	100	50	10	125	0
14	ELIWELL by Schneider Electric SXVB264●●●●●● (body 4)	70	985	150	-560	15	50	0	100	50	10	125	0
15	ELIWELL by Schneider Electric SXVB262●●●●●● (body 2) SXVB263●●●●●● (body 3)	20	195	60	-200	54	50	0	100	50	10	125	0

12.3. VALVE CONFIGURATION PARAMETERS WITH dE00 = 0

NOTE: The parameter visibility cannot be set via the serial. Verify the data given in the valve manufacturer's manual for the correct configuration.

dE00	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	DEFAULT	UM
0	dE01	16722	RW	**Stepper motor maximum speed.** Defines the maximum valve motor speed to guarantee step precision and integrity	WORD	-	-	0...9999	35	steps/s
0	dE02	16754	RW	**Stepper motor complete opening.** Defines the maximum number of valve steps. The total travel refers to the FULL STEP mode (**dE07**=0). The valve opening is complete when this value is reached.	WORD	-	-	0...9999	415	steps
0	dE03	49553	RW	**Stepper motor extra movement in total closure.** Defines the number of extra valve steps beyond the limit switch to guarantee correct total closure. A total closure command implies the valve positioned to zero and a further number of steps **dE03**.	BYTE	-	-	0...255	100	steps
0	dE04	16802	RW	**Stepper motor winding maximum current.** Defines the maximum current per phase utilised by the valve (maximum torque). Negative current value: the maximum current will be set to the value with no sign (absolute) **dE04** with an extra 50% with the valve movement command (starting or end point) within 5% of total opening, to a value equal to the absolute value of **dE04** for the other movements.	WORD	-	-	-1999...9999	-200	mA

dE00	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	DEFAULT	UM
0	dE05	49601	RW	**Stepper motor winding resistance.** Defines the electrical resistance of the single phase winding (verify fault on connections).	BYTE	-	-	0...255	35	ohm
0	dE06	16850	RW	**Stepper motor winding rated current.** Defines the phase circulating current in the valve stop condition (minimum torque).	WORD	-	-	0 ... 9999	50	mA
0	dE07	49649	RW	**Type of stepper motor control.** Defines the driving modes. • **0** = FULL STEP • **1** = HALF STEP • **2** = MICRO STEP • **3** = NOT USED • **4** = NOT USED • **5** = NOT USED **NOTE**: he current driving is a maximum value for the FULL STEP mode while the other two modes, modulating the value of the winding currents, offers greater resolution and fluidity of movement but with less torque. Refer to the literature concerning step-by-step motors for more detail.	BYTE	-	-	0 ... 5	0	num
0	dE08	50961	RW	**Stepper motor enabling/disabling duty cycle.** If the case of valve overheating, reduce the enabling duty cycle to allow it to cool down.	BYTE	-	-	0 ... 100	100	%
0	dE09	50977	RW	**Stepper motor acceleration/deceleration.** Defines the acceleration/deceleration in motor start/stop. The time between one step and the next is reduced by **dE09** at each step until **dE01** is reached. If **dE09 = 0** acceleration is not applied.	BYTE	-	-	0 ... 255	50	ms*10/ step
0	dE80	50993	RW	**Minimum stepper motor speed in acceleration/ deceleration.** Defines the minimum motor acceleration/deceleration speed.	BYTE	-	-	0 ... 255	10	steps/s
0	dE81	51008	RW	**Valve activation delay.** Represents the waiting time that the valve applies before inverting the running direction, stopping regulation or starting regulation. If **dE81** = 0, it means that the parameter is not programmed.	BYTE	-	-	0...254	50	ms
0	dE82	49472	RW	**Extra steps in total closing.** Forces an extra number of steps beyond the closing limit switch every 24 hours of valve running to ensure total closing. If **dE82** = 0, it means that the parameter is not programmed.	BYTE	-	-	0...254	0	steps/10

12.4. VALVE CONFIGURATION PARAMETERS WITH dE00 ≠ 0

dE00	VALVE	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	DEFAULT	UM
1	DANFOSS ETS 50	dE01	16738	RW	Stepper motor maximum speed	WORD	-	-	0...9999	160	steps/s
1	DANFOSS ETS 50	dE02	16770	RW	Stepper motor complete opening	WORD	-	-	0...9999	2625	steps
1	DANFOSS ETS 50	dE03	49561	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	160	steps
1	DANFOSS ETS 50	dE04	16818	RW	Maximum current stepper motor winding	WORD	-	-	-1999...9999	100	mA
1	DANFOSS ETS 50	dE05	49609	RW	Stepper motor winding resistance	BYTE	-	-	0...255	52	ohm
1	DANFOSS ETS 50	dE06	16866	RW	Idle current stepper motor winding	WORD	-	-	0...9999	75	mA
1	DANFOSS ETS 50	dE07	49657	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
1	DANFOSS ETS 50	dE08	50969	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
1	DANFOSS ETS 50	dE09	50985	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	50	ms*10/ step
1	DANFOSS ETS 50	dE80	51001	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	15	steps/s
1	DANFOSS ETS 50	dE81	51017	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	0	ms
1	DANFOSS ETS 50	dE82	49481	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	0	steps/10
2	DANFOSS ETS 100	dE01	16740	RW	Stepper motor maximum speed	WORD	-	-	0...9999	300	steps/s
2	DANFOSS ETS 100	dE02	16772	RW	Stepper motor complete opening	WORD	-	-	0...9999	3530	steps
2	DANFOSS ETS 100	dE03	49562	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	160	steps
2	DANFOSS ETS 100	dE04	16820	RW	Maximum current stepper motor winding	WORD	-	-	-1999...9999	100	mA
2	DANFOSS ETS 100	dE05	49610	RW	Stepper motor winding resistance	BYTE	-	-	0...255	52	ohm
2	DANFOSS ETS 100	dE06	16868	RW	Idle current stepper motor winding	WORD	-	-	0...9999	75	mA
2	DANFOSS ETS 100	dE07	49658	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
2	DANFOSS ETS 100	dE08	50970	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
2	DANFOSS ETS 100	dE09	50986	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	50	ms*10/ step
2	DANFOSS ETS 100	dE80	51002	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	10	steps/s
2	DANFOSS ETS 100	dE81	51018	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	0	ms
2	DANFOSS ETS 100	dE82	49482	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	0	steps/10
3	ALCO EX4/EX5/EX6	dE01	16742	RW	Stepper motor maximum speed	WORD	-	-	0...9999	500	steps/s
3	ALCO EX4/EX5/EX6	dE02	16774	RW	Stepper motor complete opening	WORD	-	-	0...9999	750	steps

dE00	VALVE	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	DEFAULT	UM
3	ALCO EX4/EX5/EX6	dE03	49563	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	100	steps
3	ALCO EX4/EX5/EX6	dE04	16822	RW	Stepper motor winding maximum current	WORD	-	-	-1999...9999	500	mA
3	ALCO EX4/EX5/EX6	dE05	49611	RW	Stepper motor winding resistance	BYTE	-	-	0...255	13	ohm
3	ALCO EX4/EX5/EX6	dE06	16870	RW	Stepper motor winding rated current	WORD	-	-	0...9999	100	mA
3	ALCO EX4/EX5/EX6	dE07	49659	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
3	ALCO EX4/EX5/EX6	dE08	50971	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
3	ALCO EX4/EX5/EX6	dE09	50987	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	50	ms*10/ step
3	ALCO EX4/EX5/EX6	dE80	51003	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	10	steps/s
3	ALCO EX4/EX5/EX6	dE81	51019	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	0	ms
3	ALCO EX4/EX5/EX6	dE82	49483	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	0	steps/10
4	NOT CONFIGURED	dE01	16750	RW	Stepper motor maximum speed	WORD	-	-	0...9999	-	steps/s
4	NOT CONFIGURED	dE02	16782	RW	Stepper motor complete opening	WORD	-	-	0...9999	-	steps
4	NOT CONFIGURED	dE03	49567	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	-	steps
4	NOT CONFIGURED	dE04	16830	RW	Maximum current stepper motor winding	WORD	-	-	-1999...9999	-	mA
4	NOT CONFIGURED	dE05	49615	RW	Stepper motor winding resistance	BYTE	-	-	0...255	-	ohm
4	NOT CONFIGURED	dE06	16878	RW	Idle current stepper motor winding	WORD	-	-	0...9999	-	mA
4	NOT CONFIGURED	dE07	49663	RW	Type of stepper motor control	BYTE	-	-	0...5	-	num
4	NOT CONFIGURED	dE08	50975	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	-	%
4	NOT CONFIGURED	dE09	50991	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	-	ms*10/ step
4	NOT CONFIGURED	dE80	51007	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	-	steps/s
4	NOT CONFIGURED	dE81	51023	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	-	ms
4	NOT CONFIGURED	dE82	49487	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	-	steps/10
5	ALCO EX7	dE01	16744	RW	Stepper motor maximum speed	WORD	-	-	0...9999	210	steps/s
5	ALCO EX7	dE02	16776	RW	Stepper motor complete opening	WORD	-	-	0...9999	1600	steps
5	ALCO EX7	dE03	49564	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	100	steps
5	ALCO EX7	dE04	16824	RW	Maximum current stepper motor winding	WORD	-	-	-1999...9999	750	mA

dE00	VALVE	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	DEFAULT	UM
5	ALCO EX7	dE05	49612	RW	Stepper motor winding resistance	BYTE	-	-	0...255	8	ohm
5	ALCO EX7	dE06	16872	RW	Idle current stepper motor winding	WORD	-	-	0...9999	250	mA
5	ALCO EX7	dE07	49660	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
5	ALCO EX7	dE08	50972	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
5	ALCO EX7	dE09	50988	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	50	ms*10/ step
5	ALCO EX7	dE80	51004	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	10	steps/s
5	ALCO EX7	dE81	51020	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	0	ms
5	ALCO EX7	dE82	49484	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	0	steps/10
6	ALCO EX8	dE01	16746	RW	Stepper motor maximum speed	WORD	-	-	0...9999	500	steps/s
6	ALCO EX8	dE02	16778	RW	Stepper motor complete opening	WORD	-	-	0...9999	2600	steps
6	ALCO EX8	dE03	49565	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	100	steps
6	ALCO EX8	dE04	16826	RW	Maximum current stepper motor winding	WORD	-	-	-1999...9999	800	mA
6	ALCO EX8	dE05	49613	RW	Stepper motor winding resistance	BYTE	-	-	0...255	6	ohm
6	ALCO EX8	dE06	16874	RW	Idle current stepper motor winding	WORD	-	-	0...9999	500	mA
6	ALCO EX8	dE07	49661	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
6	ALCO EX8	dE08	50973	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
6	ALCO EX8	dE09	50989	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	50	ms*10/ step
6	ALCO EX8	dE80	51005	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	10	steps/s
6	ALCO EX8	dE81	51021	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	0	ms
6	ALCO EX8	dE82	49485	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	0	steps/10
7	NOT CONFIGURED	dE01	16726	RW	Stepper motor maximum speed	WORD	-	-	0...9999	-	steps/s
7	NOT CONFIGURED	dE02	16758	RW	Stepper motor complete opening	WORD	-	-	0...9999	-	steps
7	NOT CONFIGURED	dE03	49555	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	-	steps
7	NOT CONFIGURED	dE04	16806	RW	Maximum current stepper motor winding	WORD	-	-	-1999...9999	-	mA
7	NOT CONFIGURED	dE05	49603	RW	Stepper motor winding resistance	BYTE	-	-	0...255	-	ohm
7	NOT CONFIGURED	dE06	16854	RW	Idle current stepper motor winding	WORD	-	-	0...9999	-	mA
7	NOT CONFIGURED	dE07	49651	RW	Type of stepper motor control	BYTE	-	-	0...5	-	num

dE00	VALVE	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	DEFAULT	UM
7	NOT CONFIGURED	dE08	50963	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	-	%
7	NOT CONFIGURED	dE09	50979	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	-	ms*10/ step
7	NOT CONFIGURED	dE80	50995	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	-	steps/s
7	NOT CONFIGURED	dE81	51011	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	-	ms
7	NOT CONFIGURED	dE82	49475	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	-	steps/10
8	Sporlan SER	dE01	16732	RW	Stepper motor maximum speed	WORD	-	-	0...9999	200	steps/s
8	Sporlan SER	dE02	16764	RW	Stepper motor complete opening	WORD	-	-	0...9999	1596	steps
8	Sporlan SER	dE03	49558	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	100	steps
8	Sporlan SER	dE04	16812	RW	Maximum current stepper motor winding	WORD	-	-	-1999...9999	120	mA
8	Sporlan SER	dE05	49606	RW	Stepper motor winding resistance	BYTE	-	-	0...255	100	ohm
8	Sporlan SER	dE06	16860	RW	Idle current stepper motor winding	WORD	-	-	0...9999	50	mA
8	Sporlan SER	dE07	49654	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
8	Sporlan SER	dE08	50966	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
8	Sporlan SER	dE09	50982	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	50	ms*10/ step
8	Sporlan SER	dE80	50998	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	10	steps/s
8	Sporlan SER	dE81	51014	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	25	ms
8	Sporlan SER	dE82	49478	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	100	steps/10
9	Sporlan SEI-30	dE01	16734	RW	Stepper motor maximum speed	WORD	-	-	0...9999	200	steps/s
9	Sporlan SEI-30	dE02	16766	RW	Stepper motor complete opening	WORD	-	-	0...9999	3193	steps
9	Sporlan SEI-30	dE03	49559	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	100	steps
9	Sporlan SEI-30	dE04	16814	RW	Stepper motor winding maximum current	WORD	-	-	-1999...9999	160	mA
9	Sporlan SEI-30	dE05	49607	RW	Stepper motor winding resistance	BYTE	-	-	0...255	75	ohm
9	Sporlan SEI-30	dE06	16862	RW	Stepper motor winding rated current	WORD	-	-	0...9999	50	mA
9	Sporlan SEI-30	dE07	49655	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
9	Sporlan SEI-30	dE08	50967	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
9	Sporlan SEI-30	dE09	50983	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	50	ms*10/ step
9	Sporlan SEI-30	dE80	50999	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	10	steps/s

dE00	VALVE	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	DEFAULT	UM
9	Sporlan SEI-30	dE81	51015	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	25	ms
9	Sporlan SEI-30	dE82	49479	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	100	steps/10
10	Sporlan SEI-50, SEH	dE01	16736	RW	Stepper motor maximum speed	WORD	-	-	0...9999	200	steps/s
10	Sporlan SEI-50, SEH	dE02	16768	RW	Stepper motor complete opening	WORD	-	-	0...9999	6386	steps
10	Sporlan SEI-50, SEH	dE03	49560	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	100	steps
10	Sporlan SEI-50, SEH	dE04	16816	RW	Maximum current stepper motor winding	WORD	-	-	-1999...9999	160	mA
10	Sporlan SEI-50, SEH	dE05	49608	RW	Stepper motor winding resistance	BYTE	-	-	0...255	75	ohm
10	Sporlan SEI-50, SEH	dE06	16864	RW	Idle current stepper motor winding	WORD	-	-	0...9999	50	mA
10	Sporlan SEI-50, SEH	dE07	49656	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
10	Sporlan SEI-50, SEH	dE08	50968	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
10	Sporlan SEI-50, SEH	dE09	50984	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	50	ms*10/ step
10	Sporlan SEI-50, SEH	dE80	51000	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	10	steps/s
10	Sporlan SEI-50, SEH	dE81	51016	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	25	ms
10	Sporlan SEI-50, SEH	dE82	49480	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	100	steps/10
11	NOT CONFIGURED	dE01	16750	RW	Stepper motor maximum speed	WORD	-	-	0...9999	-	steps/s
11	NOT CONFIGURED	dE02	16782	RW	Stepper motor complete opening	WORD	-	-	0...9999	-	steps
11	NOT CONFIGURED	dE03	49567	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	-	steps
11	NOT CONFIGURED	dE04	16830	RW	Maximum current stepper motor winding	WORD	-	-	-1999...9999	-	mA
11	NOT CONFIGURED	dE05	49615	RW	Stepper motor winding resistance	BYTE	-	-	0...255	-	ohm
11	NOT CONFIGURED	dE06	16878	RW	Idle current stepper motor winding	WORD	-	-	0...9999	-	mA
11	NOT CONFIGURED	dE07	49663	RW	Type of stepper motor control	BYTE	-	-	0...5	-	num
11	NOT CONFIGURED	dE08	50975	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	-	%
11	NOT CONFIGURED	dE09	50991	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	-	ms*10/ step
11	NOT CONFIGURED	dE80	51007	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	-	steps/s
11	NOT CONFIGURED	dE81	51023	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	-	ms
11	NOT CONFIGURED	dE82	49487	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	-	steps/10
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE01	16730	RW	Stepper motor maximum speed	WORD	-	-	0...9999	160	steps/s

dE00	VALVE	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	DEFAULT	UM
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE02	16762	RW	Stepper motor complete opening	WORD	-	-	0...9999	2500	steps
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE03	49557	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	100	steps
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE04	16810	RW	Maximum current stepper motor winding	WORD	-	-	-1999...9999	120	mA
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE05	49605	RW	Stepper motor winding resistance	BYTE	-	-	0...255	100	ohm
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE06	16858	RW	Idle current stepper motor winding	WORD	-	-	0...9999	50	mA
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE07	49653	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE08	50965	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE09	50981	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	255	ms*10/ step
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE80	50997	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	12	steps/s
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE81	51013	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	25	ms
12	Sporlan SER (I) B/ C/ D/ G/ J/ K/	dE82	49477	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	100	steps/10
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE01	16722	RW	Stepper motor maximum speed	WORD	-	-	0...9999	35	steps/s
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE02	16754	RW	Stepper motor complete opening	WORD	-	-	0...9999	415	steps
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE03	49553	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	100	steps
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE04	16802	RW	Stepper motor winding maximum current	WORD	-	-	-1999...9999	-200	mA
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE05	49601	RW	Stepper motor winding resistance	BYTE	-	-	0...255	35	ohm
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE06	16850	RW	Stepper motor winding rated current	WORD	-	-	0...9999	50	mA
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE07	49649	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE08	50961	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE09	50977	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	50	ms*10/ step
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE80	50993	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	10	steps/s
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE81	51009	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	125	ms

dE00	VALVE	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	DEFAULT	UM
13	ELIWELL by Schneider Electric SXVB261●●●●●●	dE82	49473	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	0	steps/10
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE01	16728	RW	Stepper motor maximum speed	WORD	-	-	0...9999	70	steps/s
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE02	16760	RW	Stepper motor complete opening	WORD	-	-	0...9999	985	steps
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE03	49556	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	150	steps
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE04	16808	RW	Stepper motor winding maximum current	WORD	-	-	-1999...9999	-560	mA
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE05	49604	RW	Stepper motor winding resistance	BYTE	-	-	0...255	15	ohm
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE06	16856	RW	Stepper motor winding rated current	WORD	-	-	0...9999	50	mA
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE07	49652	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE08	50964	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE09	50980	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	50	ms*10/ step
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE80	50996	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	10	steps/s
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE81	51012	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	125	ms
14	ELIWELL by Schneider Electric SXVB264●●●●●●	dE82	49476	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	0	steps/10
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE01	16724	RW	Stepper motor maximum speed	WORD	-	-	0...9999	20	steps/s
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE02	16756	RW	Stepper motor complete opening	WORD	-	-	0...9999	195	steps
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE03	49554	RW	Stepper motor extra movement in total closure	BYTE	-	-	0...255	60	steps
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE04	16804	RW	Maximum current stepper motor winding	WORD	-	-	-1999...9999	-200	mA

dE00	VALVE	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	DEFAULT	UM
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE05	49602	RW	Stepper motor winding resistance	BYTE	-	-	0...255	54	ohm
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE06	16852	RW	Idle current stepper motor winding	WORD	-	-	0...9999	50	mA
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE07	49650	RW	Type of stepper motor control	BYTE	-	-	0...5	0	num
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE08	50962	RW	Stepper motor enabling/disabling duty cycle	BYTE	-	-	0...100	100	%
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE09	50978	RW	Stepper motor acceleration/ deceleration	BYTE	-	-	0...255	50	ms*10/ step
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE80	50994	RW	Minimum stepper motor speed in acceleration/deceleration	BYTE	-	-	0...255	10	steps/s
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE81	51010	RW	Valve pause time before reverse running, stop or start.	BYTE	-	-	0...254	125	ms
15	ELIWELL by Schneider Electric SXVB262●●●●●●/ SXVB263●●●●●●	dE82	49474	RW	Stepper motor extra steps in total closure every 24 hours	BYTE	-	-	0...254	0	steps/10

12.5. FOLDER VISIBILITY TABLE

FOLDER	ADDRESS PAR VAL	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	MODEL				UM
								LAN	RS-485	DIGITAL	ACTUATOR	
rE	49424.0	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
Ai	49424.2	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
of	49424.4	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
dO	49424.6	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
SP	49425.0	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
PAr	49425.2	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
FnC	49425.4	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
PASS	49425.6	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
SP1	49426.2	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
SP2	49426.4	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
SP3	49426.6	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
SP4	49427.0	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
dF	49427.4	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
dL	49427.2	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
dE	49427.6	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
UI	49428.0	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
CC	49428.2	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
UL	49459,2	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
DL	49459,4	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
FR	49459,6	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
dF43	49449.0	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num
dF44	49449.2	RW	Folder visibility	2 bit	-	-	0...3	3	3	3	3	num

12.6. CLIENT TABLE

FOLDER	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	UM
Ai	dAi1	563	R	Analogue input (display) 1	WORD	Y	-1	-500...9999	°C/°F/ bar/PSI
Ai	dAi2	565	R	Analogical Input (display) 2	WORD	Y	-1	-500...9999	°C/°F/ bar/PSI
Ai	dAi3	567	R	Analogue Input (display) 3	WORD	Y	-1	-500...9999	°C/°F
Ai	dAi4	569	R	Analogue Input (display) 4	WORD	Y	-1	-500...9999	°C/°F
Ai	drE1	432	R	Valve overheating temperature EEVD	WORD	Y	-1	-500...9999	°C/°F
Ai	drE2	434	R	Valve saturation temperature EEVD	WORD	Y	-1	-500...9999	°C/°F
Ai	drE3	436	R	Valve overheating temperature EEVD (backup)	WORD	Y	-1	-500...9999	°C/°F
Ai	drE4	438	R	Valve saturation temperature EEVD (backup)	WORD	Y	-1	-500...9999	°C/°F
Ai	drE5	446	R	Valve overheating EEVD	WORD	Y	-1	-500...9999	K/°R
Ai	drE6	448	R	valve evaporator pressure EEVD	WORD	Y	-1	-500...9999	bar/PSI
Ai	drE7	450	R	valve opening percentage EEVD	WORD	-	-1	-500...9999	%
Ai	SP4	519	R	valve overheating setpoint EEVD	WORD	Y	-1	-500...9999	K/°R
Ai	evaporatorPress	525	RW	remote valve evaporator pressure*	WORD	Y	-1	-500...9999	PSI
Ai	evaporatorTemp	527	RW	valve saturation temperature from remote*	WORD	Y	-1	-500...9999	°F
Di	ddi1	33062	R	Digital input 1	1 bit	-	-	0...1	flag
Di	ddi2	33062.1	R	Digital input 2	1 bit	-	-	0...1	flag
Di	Dip1	33058,1	R	DIP switch 1 status	1 bit	-	-	0...1	flag
Di	Dip2	33058.2	R	DIP switch 2 status	1 bit	-	-	0...1	flag
Di	Dip3	33058.3	R	DIP switch 3 status	1 bit	-	-	0...1	flag
Di	Dip4	33058.4	R	DIP switch 4 status	1 bit	-	-	0...1	flag
Di	Dip5	33058,5	R	DIP switch 5 status	1 bit	-	-	0...1	flag
Di	Dip6	33058,6	R	DIP switch 6 status	1 bit	-	-	0...1	flag
dO	ddO1	33063.6	R	Digital output dO1	1 bit	-	-	0...1	flag
dO	ddO2	33063.5	R	Digital output dO2	1 bit	-	-	0...1	flag
Alarm	Er01	33052.1	R	Probe error Ai1	1 bit	-	-	0...1	flag
Alarm	Er02	33052.2	R	Probe error Ai2	1 bit	-	-	0...1	flag
Alarm	Er03	33052.3	R	Probe error Ai3	1 bit	-	-	0...1	flag
Alarm	Er04	33052.4	R	Probe error Ai4	1 bit	-	-	0...1	flag
Alarm	Er05	33052.5	R	Valve overheating probe alarm EEVD	1 bit	-	-	0...1	flag
Alarm	Er06	33052.6	R	Valve saturation probe alarm EEVD	1 bit	-	-	0...1	flag
Alarm	Er07	33052.7	R	Valve MOP alarm EEVD	1 bit	-	-	0...1	flag
Alarm	Er08	33053	R	Valve output max alarm EEVD	1 bit	-	-	0...1	flag
Alarm	Er09	33053.1	R	Valve external alarm EEVD	1 bit	-	-	0...1	flag
Alarm	Er10	33053.2	R	Valve no-link alarm EEVD	1 bit	-	-	0...1	flag

FOLDER	LABEL	ADDRESS PAR. VALUE	R/W	DESCRIPTION	DATA SIZE	CPL	EXP	RANGE	UM
Alarm	Er11	33053.3	R	Valve motor alarm EEVD: high current absorption	1 bit	-	-	0...1	flag
Alarm	Er12	33053.4	R	Valve motor alarm EEVD: winder 1 not connected	1 bit	-	-	0...1	flag
Alarm	Er13	33053.5	R	Valve motor alarm EEVD: winder 1 in short circuit	1 bit	-	-	0...1	flag
Alarm	Er14	33053.6	R	Valve motor alarm EEVD: winding 2 not connected	1 bit	-	-	0...1	flag
Alarm	Er15	33053.7	R	Valve motor alarm EEVD: winder 2 in short circuit	1 bit	-	-	0...1	flag
State	EEV_STTS_ON	33257	R	Enable EEVD valve control	1 bit	-	-	0...1	flag
State	EEV_STTS_ALM	33257.1	R	EEVD alarm	1 bit	-	-	0...1	flag
State	EEV_STTS_DEFR	33257.2	R	EEVD defrost	1 bit	-	-	0...1	flag
State	EEV_STTS_NOLINK	33257.3	R	control status in no-link	1 bit	-	-	0...1	flag
State	EEV_STTS_MOD	33257.4	R	Select operating mode	2 bit	-	-	0...3	num
State	EEV_STTS_SPECIAL_ON	33257.6	R	Opening state of fixed valve before EEVD closure	1 bit	-	-	0...1	num
State	EEV_STTS_FORCE_OPEN	33257.7	R	Forced complete EEVC valve opening state	1 bit	-	-	0...1	num
Net Command	EEV_STTS_ON_SET	33259	W	Valve control ON	1 bit	-	-	0...1	flag
Net Command	EEV_STTS_ALM_SET	33259.1	W	Alarm status ON	1 bit	-	-	0...1	flag
Net Command	EEV_STTS_DEFR_SET	33259.2	W	Defrost status ON	1 bit	-	-	0...1	flag
Net Command	EEV_STTS_SPECIAL_ON_SET	33259.6	W	Valve opening command FIX ON	1 bit	-	-	0...1	flag
Net Command	EEV_STTS_FORCE_OPEN_SET	33259.7	W	Valve opening command 100% ON	1 bit	-	-	0...1	flag
Net Command	EEV_STTS_MOD_SET	33259.4	W	Selection command operating mode **0**: 00 → Control 1 **1**: 01 → Control 2 **2**: 10 → Control 3 **3**: 11 → Control 4	2 bit	-	-	0...3	num
Net Command	EEV_STTS_ON_RESET	33259	W	Valve control OFF	1 bit	-	-	0...1	flag
Net Command	EEV_STTS_ALM_RESET	33259.1	W	Alarm status OFF	1 bit	-	-	0...1	flag
Net Command	EEV_STTS_DEFR_RESET	33259.2	W	Defrost status OFF	1 bit	-	-	0...1	flag
Net Command	EEV_STTS_SPECIAL_ON_RESET	33259.6	W	Valve opening command FIX OFF	1 bit	-	-	0...1	flag
Net Command	EEV_STTS_FORCE_OPEN_RESET	33259.7	W	Valve opening command 100% OFF	1 bit	-	-	0...1	flag

(*) shared probe

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