Modicon M172 Electronic Expansion Valve Driver

Preconfigured Valves Parameters Guide

Original instructions

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Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Qualification of Personnel

Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation are authorized to work on and with this product.

The qualified person must be able to detect possible hazards that may arise from parameterization, modifying parameter values and generally from mechanical, electrical, or electronic equipment. The qualified person must be familiar with the

standards, provisions, and regulations for the prevention of industrial accidents, which they must observe when designing and implementing the system.

Intended Use

The products described or affected by this document, together with software, accessories, and options, are controllers, intended for commercial HVAC machines according to the instructions, directions, examples, and safety information contained in the present document and other supporting documentation.

The product may only be used in compliance with all applicable safety regulations and directives, the specified requirements, and the technical data.

Prior to using the product, you must perform a risk assessment in view of the planned application. Based on the results, the appropriate safety-related measures must be implemented.

Since the product is used as a component in an overall machine or process, you must ensure the safety of persons by means of the design of this overall system.

Operate the product only with the specified cables and accessories. Use only genuine accessories and spare parts.

Any use other than the use explicitly permitted is prohibited and can result in unanticipated hazards.

Prohibited Use

Any use other than that expressed above under Permitted use is strictly prohibited.

The relay contacts supplied are of an electromechanical type and subject to wear. Functional safety protection devices, specified in international or local standards, must be installed externally to this device.

Liability and Residual Risks

The liability of Schneider Electric is limited to the proper and professional use of this product under the guidelines contained in the present and other supporting documents, and does not extend to damages caused by (but not limited to):

- Unspecified installation/use and, in particular, in contravention of the safety requirements of established legislation 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 in which dangerous components can be accessed without the use of specific tools;
- Installation/use on equipment which does not comply with established legislation and standards.

Disposal

The appliance (or the product) must be disposed of separately in compliance with the local standards in force on waste disposal.

About the Document

Document Scope

This document describes the preconfigured valve parameters into the Modicon M172 Electronic Expansion Valve Driver and TM173ODEM22R controller.

NOTE: Read and understand this document and all related documents, page 9 before installing, operating, or maintaining your device.

Validity Note

This document has been updated for the release of EcoStruxure Machine Expert - HVAC V1.7.0.

Product Related Information

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- 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 and confirm that a proper ground connection exists before applying power to the unit.
- Use only the specified voltage when operating this equipment and any associated products.

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

This equipment has been designed to operate outside of any hazardous location, and exclusive of applications that generate, or have the potential to generate, hazardous atmospheres. Only install this equipment in zones known to be free, at all times, of hazardous atmospheres.

⚠DANGER

POTENTIAL FOR EXPLOSION

- Install and use this equipment in non-hazardous locations only.
- Do not install and use this equipment in applications capable of generating hazardous atmospheres, such as those applications employing flammable refrigerants.

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

For information concerning the use of control equipment in applications capable of generating hazardous materials, consult your local, regional, or national standards bureau or certification agency.

⚠WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop, power outage and restart.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines.[1]
- Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

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

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

⚠WARNING

UNINTENDED EQUIPMENT OPERATION

- Only use software approved by Schneider Electric for use with this equipment.
- Update your application program every time you change the physical hardware configuration.

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

General Cybersecurity Information

In recent years, the growing number of networked machines and production plants has seen a corresponding increase in the potential for cyber threats, such as unauthorized access, data breaches, and operational disruptions. You must, therefore, consider all possible cybersecurity measures to help protect assets and systems against such threats.

To help keep your Schneider Electric products secure and protected, it is in your best interest to implement the cybersecurity best practices as described in the Cybersecurity Best Practices document.

Schneider Electric provides additional information and assistance:

- Subscribe to the Schneider Electric security newsletter.
- Visit the Cybersecurity Support Portal web page to:
  - Find Security Notifications.
  - Report vulnerabilities and incidents.
- Visit the Schneider Electric Cybersecurity and Data Protection Posture web page to:
  - Access the cybersecurity posture.
  - Learn more about cybersecurity in the cybersecurity academy.
  - Explore the cybersecurity services from Schneider Electric.

Related Documents

Title of documentation	Reference number
Cybersecurity Best Practices	Refer to General Cybersecurity Information, page 9
Modicon M172 Electronic Expansion Valve Driver - User Guide	EIO0000004034 (ENG)
EcoStruxure Machine Expert - HVAC - Operating Guide	EIO0000003412 (ENG)
Modicon M172 Electronic Expansion Valve Driver - Instruction Sheet	GDE42243
TM172 Optimized & Performance 7/18 IO - Instruction Sheet	QGH90428
TM172 Performance 28/42 IO - Instruction Sheet	NHA87740
TM172 Optimized & Performance Isolated 28/42 IO - Instruction Sheet	PHA83703
TM172 Optimized & Performance Expansion 12/28 IO - Instruction Sheet	QGH26895
Modicon M173 Optimized Logic Controller - Hardware Guide	EIO0000005114

To find documents online, visit the Schneider Electric download center (www.se.com/ww/en/download/).

Information on Non-Inclusive or Insensitive Terminology

As a responsible, inclusive company, Schneider Electric is constantly updating its communications and products that contain non-inclusive or insensitive terminology. However, despite these efforts, our content may still contain terms that are deemed inappropriate by some customers.

Electronic Expansion Valve

Before connecting the valve, carefully configure the TM172EVEV•• driver or the TM173ODEM22R controller by selecting the type of valve from the valves list.

⚠WARNING

UNINTENDED EQUIPMENT OPERATION

- Verify the correct selection of valve model (refer to dE00 parameter).
- Verify the valve parameters and data provided by the valve manufacturer before using the valve.

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 correct connection, adhere 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.

Terminology Derived from Standards

The technical terms, terminology, symbols and the corresponding descriptions in the information contained herein, or that appear in or on the products themselves, are generally derived from the terms or definitions of international standards.

In the area of functional safety systems, drives and general automation, this may include, but is not limited to, terms such as *safety, safety function, safe state, fault, fault reset, malfunction, failure, error, error message, dangerous,* etc.

Among others, these standards include:

Standard	Description
IEC 61131–2:2007	Programmable controllers, part 2: Equipment requirements and tests.
ISO 13849–1:2023	Safety of machinery: Safety related parts of control systems. General principles for design.
EN 61496–1:2013	Safety of machinery: Electro-sensitive protective equipment. Part 1: General requirements and tests.
ISO 12100:2010	Safety of machinery — General principles for design — Risk assessment and risk reduction.
EN 60204–1:2006	Safety of machinery — Electrical equipment of machines — Part 1: General requirements.
ISO 14119:2013	Safety of machinery — Interlocking devices associated with guards — Principles for design and selection.
ISO 13850:2015	Safety of machinery — Emergency stop — Principles for design.
IEC 62061:2021	Safety of machinery — Functional safety of safety-related electrical, electronic, and electronic programmable control systems.

IEC 61508–1:2010	Functional safety of electrical/electronic/ programmable electronic safety-related systems: General requirements.
IEC 61508–2:2010	Functional safety of electrical/electronic/ programmable electronic safety-related systems: Requirements for electrical/electronic/ programmable electronic safety-related systems.
IEC 61508–3:2010	Functional safety of electrical/electronic/ programmable electronic safety-related systems: Software requirements.
IEC 61784–3:2021	Industrial communication networks — Profiles — Part 3: Functional safety fieldbuses — General rules and profile definitions.
2006/42/EC	Machine Directive
2014/30/EU	Electromagnetic Compatibility Directive
2014/35/EU	Low Voltage Directive

In addition, terms used in the present document may tangentially be used as they are derived from other standards such as:

Standard	Description
IEC 60034 series	Rotating electrical machines.
IEC 61800 series	Adjustable speed electrical power drive systems.
IEC 61158 series	Digital data communications for measurement and control — Fieldbus for use in industrial control systems.

Finally, the term *zone of operation* may be used in conjunction with the description of specific hazards, and is defined as it is for a *hazard zone* or *danger zone* in the *Machinery Directive (2006/42/EC)* and *ISO 12100:2010*.

NOTE: The aforementioned standards may or may not apply to the specific products cited in the present documentation. For more information concerning the individual standards applicable to the products described herein, see the characteristics tables for those product references.

Preconfigured EEV Information

Preconfigured Electronic Expansion Valves

Unipolar Preconfigured Electronic Expansion Valves

Unipolar electronic valve references for which a set of parameters is provided, page 15:

Brand	Range	Reference	Reference
Parker-Sporlan	CEV	10, 14, 16, 18, 24, 26; 30, 32	RACE Catalog CEV Series, April 2018
Sanhua	DPF	(T01), (TS1), (S03)	DS-DPF_T/S-EN-R1605 2018
Saginomiya	UKV	10D, 14D, 18D, 25D, 30D, 32D, 40D	PLRCA.PB.V1.A1.02 / 520H3055 09/2008 Electronic Expansion Valves High Volume OEM Item (Type UKV, VKV, AKV) USCO.PD.V1.A1.22 / 521U0082 1-2008

Bipolar Preconfigured Electronic Expansion Valves

Bipolar electronic valve references for which a set of parameters is provided, page 16:

Brand	Range	Reference	Reference
Parker-Sporlan	SER	AA, B, C, D	April 2018 / Bulletin 100-20
	SERI	F, G, J, K, L	December 2012 / Bulletin 100-20-4 (Type SERI-F)
	SEHI	175, 400	
Emerson-ALCO	EX	4, 5, 6, 7, 8	Electrical Control Valves EX4/5/6/7/8 Series 05/08/13
Danfoss	ETS	12.5, 25, 50, 100, 250, 400	DKRCC.PD.VD1.1C.02 2018.10
	ETS Colibri	12C, 24C, 50C, 100C	DKRCC.PD.VD1.E6.02 2018.11

Wiring Description for Unipolar Valves

Wiring Description

NOTE: The information below is presented in conformity with the technical documentation for the corresponding products listed in the table. Manufacturer specifications are subject to modify without notice.

The following table indicates the wire color for various common valves:

			VMOT	VMOT	W2-	W2+	W1-	W1+
Parker Sporlan	CEV	CEV10, 14, 16, 18, 24, 26, 30, 32	-	Grey	Black	Red	Orange	Yellow
Sanhua	DPF (T01), (TS1), (S03)	DPF(T01) 1.3C-07, 1.65C-05, 1.8C-08, 2.0C-03, 2.2C-01, 2.4C-1, DPF(TS1) 3.0C-01, 3.2C-01, DPF(S03) 4.0C-01, 4.5C-01, 5.5C-01, 6.5C-02	Blue					
Sagino-miya	UKV	UKV-10D, 14D, 18D, 25D, 30D, 32D, 40D	-					

⚠WARNING

UNINTENDED EQUIPMENT OPERATION

Before wiring valve, verify the wiring in the valve manufacturer Technical Data.

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

Wiring Description for Bipolar Valves

Wiring Description

NOTE: The information below is presented in conformity with the technical documentation for the corresponding products listed in the table. Manufacturer specifications are subject to modify without notice.

The following table indicates the wire color for various common valves:

			W2- / W•2-	W2+ / W•2+	W1- / W•1-	W1+ / W•1+
Parker Sporlan	SER, SERI, SEHI	SER-AA, -B, -C, -D, SERI-F, -G, -J, -K, -L, SEHI-175, -400	Green	Red	White	Black
Emerson ALCO	EX	EX4, 5, 6, EX7, EX8	White	Black	Blue	Brown
DANFOSS	ETS	ETS 12.5, 25, 50, ETS100, ETS250, 400, ETS12C, 24C, 50C, 100C	Green	Red	Black	White

⚠WARNING

UNINTENDED EQUIPMENT OPERATION

Before wiring valve, verify the wiring in the valve manufacturer Technical Data.

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

Preconfigured Unipolar Valve Configuration Parameters

Preconfigured Unipolar Valve Configuration Parameters

Preconfigured valve configuration parameters are stored in the `EEVDSettingsU/B` Application Function Block (refer to Modicon M172 Electronic Expansion Valve Driver, User Guide or Modicon M173 Optimized Logic Controller, Hardware Guide).

NOTE: The information below is presented in conformity with the technical documentation for the corresponding products listed in the table. Manufacturer specifications are subject to modify without notice.

Valve parameters if *dE00*≠0 (unused *dE00* values are reserved):

LABEL	Parker-Sporlan	Sanhua			Saginomiya
	CEV	DPF(T01)	DPF(TS1)	DPF(S03)*	UKV
	10, 14, 16, 18, 24, 26, 30, 32	1.3C-07, 1.65C-05, 1.8C-08, 2.0C-03, 2.4C-1	3.0C-01, 3.2C-01	4.0C-01, 4.5C-01, 5.5C-01, 6.5C-02	10D, 14D, 18D, 25D, 30D, 32D, 40D
dE00	**1**	**2**		**3**	**4**
dE01	40	45		20	16
dE02	250				240
dE03	0	23		16	20
dE04	260			375	260
dE05	46			32	46
dE06	0				
dE07	1				
dE08	100				
dE09	0				
dE80	0				
n10	0				500
n11	30	0			
n12…n15	0				
n16	2				
n17	40	45		20	16
n18	0				
n19	3072				
n20	256				
n21	50				
n22	288				
n23	1296				
n24	2562				
n25	240				
n26…n30	0				
n31	1				
n32…n36	0				
n37	0				500
n38	0	100			500
n39…n40	0				

(*) Not applicable for TM173ODEM22R controller. The TM173ODEM22R controller can drive unipolar valves with a maximum coil current of 200 mA per phase (200 mA/Ph).

Preconfigured Bipolar Valve Configuration Parameters

Preconfigured Bipolar Valve Configuration Parameters

Preconfigured valve configuration parameters are stored in the `EEVDSettingsU/B` Application Function Block (refer to Modicon M172 Electronic Expansion Valve Driver, User Guide).

NOTE: The information below is presented in conformity with the technical documentation for the corresponding products listed in the table. Manufacturer specifications are subject to modify without notice.

Valve parameter if *dE00*≠0 (unused *dE00* values are reserved):

LABEL	Parker-Sporlan				Emerson-ALCO			Danfoss			
	SER	SERI	SERI	SEHI	EX			ETS			
	AA, B, C, D	F, G, J, K	L	175, 400	4, 5, 6	7 *	8	12.5, 25, 50	100	250, 400	12C, 24C, 50C, 100C
dE00	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
dE01	200				500	210	500	300			240
dE02	2500			6386	750	1600	2600	2625	3530	3810	600
dE03	0				100			263	353	160	6
dE04	90	150		120	500	750	800	100			800
dE05	100			75	13	8	6	52			10
dE06	0				100	250	500	100			0
dE07	0										2
dE08	100										
dE09	0		50	0							
dE80	0		10	0							
n10	25				0						
n11	100				0						
n12…n15	0										
n16	1										
n17	0										
n18	0				1						
n19	3072										
n20	256										
n21	50										
n22	288										
n23	1296										
n24	2562										
n25	240										
n26…30	0										
n31	1										
n32…n36	0										
n37	25				0						
n38	25				0						10
n39…n40	0										

*: Maximum Operating Pressure Differential (MOPD) allowed is 20 bar.

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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