

Modicon M172 Electronic Expansion Valve Driver Preconfigured Valves Parameters Guide

Original instructions

11/2020



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. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

You agree not to reproduce, other than for your own personal, noncommercial use, all or part of this document on any medium whatsoever without permission of Schneider Electric, given in writing. You also agree not to establish any hypertext links to this document or its content. Schneider Electric does not grant any right or license for the personal and noncommercial use of the document or its content, except for a non-exclusive license to consult it on an "as is" basis, at your own risk. All other rights are reserved.

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 Schneider Electric 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.

© 2020 Schneider Electric. All rights reserved.

Table of Contents



	Safety Information	5
	About the Book	7
Chapter 1	Preconfigured EEV Information	11
	Preconfigured Electronic Expansion Valves	12
	Wiring Description for Unipolar Valves	13
	Wiring Description for Bipolar Valves	14
	Preconfigured Unipolar Valve Configuration Parameters	15
	Preconfigured Bipolar Valve Configuration Parameters	16



Important Information

NOTICE

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 Book



At a Glance

Document Scope

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

NOTE: Read and understand this document and all related documents (*see Modicon M172 Electronic Expansion Valve Driver, User Guide*) before installing, operating, or maintaining your device.

Validity Note

This document has been updated for the release of EcoStruxure Machine Expert - HVAC V1.3.

For product compliance and environmental information (RoHS, REACH, PEP, EOLI, etc.), go to www.schneider-electric.com/green-premium.



The technical characteristics of the devices described in the present document also appear online. To access the information online, go to the Schneider Electric home page <https://www.se.com/ww/en/download/>.

Related Documents

Title of documentation	Reference number
TM172 Electronic Expansion Valve Driver - User Guide	EIO000004034 (ENG)
EcoStruxure Machine Expert - HVAC software - Operating Guide	EIO000003412 (ENG)
TM172 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

You can download these technical publications and other technical information from our website at www.schneider-electric.com/en/download.

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.

Electronic Expansion Valve

Before connecting the valve, carefully configure the TM172EVEV** driver 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 this manual, 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 13849-1:2015	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 62061:2015	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 61784-3:2016	Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses - General rules and profile definitions.
2006/42/EC	Machinery 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.

Chapter 1

Preconfigured EEV Information

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Preconfigured Electronic Expansion Valves	12
Wiring Description for Unipolar Valves	13
Wiring Description for Bipolar Valves	14
Preconfigured Unipolar Valve Configuration Parameters	15
Preconfigured Bipolar Valve Configuration Parameters	16

Preconfigured Electronic Expansion Valves

Unipolar Preconfigured Electronic Expansion Valves

Unipolar electronic valve references for which a set of parameters is provided (*see 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 (*see page 16*):

Brand	Range	Reference	Reference
Parker-Sporlan	SER	AA, B, C, D	April 2018 / Bulletin 100-20 December 2012 / Bulletin 100-20-4 (Type SERI-F)
	SERI	F, G, J, K, L	
	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:

Terminal	Parker Sporlan	Sanhua	Saginomiya
	CEV	DPF(T01), (TS1), (S03)	UKV
	CEV10, 14, 16, 18, 24, 26, 30, 32	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	UKV-10D, 14D, 18D, 25D, 30D, 32D, 40D
VMOT	-	Blue	-
VMOT		Grey	
W1+		Yellow	
W1-		Orange	
W2+		Red	
W2-		Black	

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:

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

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 (see *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 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			

Preconfigured Bipolar Valve Configuration Parameters

Preconfigured Bipolar Valve Configuration Parameters

Preconfigured valve configuration parameters are stored in the `EEVDS settingsU/B` Application Function Block (see *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				208
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.