

User Manual for Communication

Temperature Controllers

KPN Series

ACM-E-0301-AC

Thank you for purchasing an Autonics product.

This user manual contains information about the product and its proper use,
and should be kept in a place where it will be easy to access.

Preface

Thank you for purchasing Autonics product.

Please familiarize yourself with the information contained in the **Safety Precautions** section before using this product.

This user manual contains information about the product and its proper use, and should be kept in a place where it will be easy to access.

User Manual Guide

Please familiarize yourself with the information in this manual before using the product.

- This manual provides detailed information on the product's features. It does not offer any guarantee concerning matters beyond the scope of this manual.
- This manual may not be edited or reproduced in either part or whole without permission.
- A user manual is not provided as part of the product package.
Visit our web site (www.autonics.com) to download a copy.
- The manual's content may vary depending on changes to the product's software and other unforeseen developments within Autonics, and is subject to change without prior notice. Upgrade notice is provided through out homepage.
- We contrived to describe this manual more easily and correctly. However, if there are any corrections or questions, please notify us these on our homepage.

Communication protocol

KPN Series is supported to Modbus RTU protocol.

However, it does not support broadcast commands.

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1 Modbus RTU protocol

1.1 Read Coil Status(Func01-01H)

Reads the output (OX reference, Coil) ON/OFF status in Slave device.

1) Query(Master)

Slave Address	Function	Starting Address		No. of Points		Error Check(CRC16)	
		High	Low	High	Low	Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

← CRC16 →

2) Response(Slave)

Slave Address	Function	Byte Count	Data	Data	Data	Error Check(CRC16)	
						Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

← CRC16 →

If read the output status(ON: 1, OFF: 0) of 10EA within coil 000001(0000 H) to 000010(0009 H) on Slave side(Address 17) from Master side.

▪ Query(Master)

Slave Address	Function	Starting Address		No. of Points		Error Check(CRC16)	
		High	Low	High	Low	Low	High
11 H	02 H	00 H	00 H	00 H	0A H	## H	## H

If the values range from coil 000008(0007 H) to 000001(0000 H) on the slave side are "ON-ON-OFF-OFF-ON-ON-OFF-ON", and the values from 000010(0009 H) to 000009(0008 H) are respectively "OFF-ON".

▪ Response(Slave)

Slave Address	Function	Byte Count	Data (000008 to 000001)	Data (000010 to 000009)	Error Check(CRC16)	
					Low	High
11 H	01 H	02 H	CD H	01 H	## H	## H

1.2 Read Input Status(Func02-02H)

Read Input ON/OFF status(1X reference) in Slave device.

(1) Query(Master)

Slave Address	Function	Starting Address		No. of Points		Error Check(CRC16)	
		High	Low	High	Low	Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

← CRC16 →

(2) Response(Slave)

Slave Address	Function	Byte Count	Data	Data	Data	Error Check(CRC16)	
						Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

← CRC16 →

If read the input status(ON: 1, OFF: 0) of 10EA range 100001(0000 H) to 100010(0009 H) in the Slave side (Address 17) from the Master side.

▪ Query(Master)

Slave Address	Function	Starting Address		No. of Points		Error Check(CRC16)	
		High	Low	High	Low	Low	High
11 H	02 H	00 H	00 H	00 H	0A H	## H	## H

If the values range 100008(0007 H) to 100001(0000 H) on slave side are “ON-ON-OFF-OFF-ON-ON-OFF-ON”, and the values of 100010(0009 H) to 100009(0008 H) are respectively “OFF-ON”.

▪ Response(Slave)

Slave Address	Function	Byte Count	Data (000008 to 000001)	Data (000010 to 000009)	Error Check(CRC16)	
					Low	High
11 H	02 H	02 H	CD H	01 H	## H	## H

1.3 Read Holding Registers(Func03-03H)

Read the Binary data of Holding Registers(4X reference) in Slave device.

(1) Query(Master)

Slave Address	Function	Starting Address		No. of Points		Error Check(CRC16)	
		High	Low	High	Low	Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte
CRC16							

(2) Response(Slave)

Slave Address	Function	Byte Count	Data		Data		Data		Error Check(CRC16)	
			High	Low	High	Low	High	Low	Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte
CRC16										

If read the values of 2EA, from Holding Register 400001(0000 H) to 400002(0001 H), in Slave(Address 17) from the Master.

▪ Query(Master)

Slave Address	Function	Starting Address		No. of Points		Error Check(CRC16)	
		High	Low	High	Low	Low	High
11 H	03 H	00 H	00 H	00 H	02 H	## H	## H

If the value of 400001(0000 H) on Slave side is "555(22B H)" and the value of 400002(0001 H) is "100 (64 H)".

▪ Response(Slave)

Slave Address	Function	Byte Count	Data		Data		Error Check(CRC16)	
			High	Low	High	Low	Low	High
11 H	03 H	04 H	02 H	2B H	00 H	64 H	## H	## H

1.4 Read Input Registers(Func04-04H)

Read the Binary data of Input Registers(3X reference) in Slave device.

(1) Query(Master)

Slave Address	Function	Starting Address		No. of Points		Error Check(CRC16)	
		High	Low	High	Low	Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte
CRC16							

(2) Response(Slave)

Slave Address	Function	Byte Count	Data	Data	Data	Error Check(CRC16)	
						Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte
CRC16							

If read the values of 2EA range from Input Register 300001(0000 H) to 300002(0001 H) on Slave side(Address 17) from Master side.

▪ Query(Master)

Slave Address	Function	Starting Address		No. of Points		Error Check(CRC16)	
		High	Low	High	Low	Low	High
11 H	04 H	00 H	00 H	00 H	02 H	## H	## H

If the values of 300001(0000 H) and 300002(0001 H) are respectively "10(A H)" and "20(14 H)" on Slave side are respectively.

▪ Response(Slave)

Slave Address	Function	Byte Count	Data		Data		Error Check(CRC16)	
			High	Low	High	Low	Low	High
11 H	04 H	04 H	00 H	0A H	00 H	14 H	## H	## H

1.5 Preset Single Registers(Func06–06H)

Read the Binary data of single Holding Registers (4X reference) in Slave device.

(1) Query(Master)

Slave Address	Function	Register Address		Preset Data		Error Check(CRC16)	
		High	Low	High	Low	Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte
← CRC16 →							

(2) Response(Slave)

Slave Address	Function	Register Address		Preset Data		Error Check(CRC16)	
		High	Low	High	Low	Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte
← CRC16 →							

If write "10(A H)" to Holding Register 400001(0000 H) on Slave(Address 17) from Master.

▪ Query(Master)

Slave Address	Function	Starting Address		Preset Data		Error Check(CRC16)	
		High	Low	High	Low	Low	High
11 H	06 H	00 H	00 H	00 H	0A H	## H	## H

▪ Response(Slave)

Slave Address	Function	Starting Address		Preset Data		Error Check(CRC16)	
		High	Low	High	Low	Low	High
11 H	06 H	00 H	00 H	00 H	0A H	## H	## H

1.6 Preset Multiple Registers(Func16-10H)

Write the Binary data of Holding Registers (4X reference) consecutively in Slave device.

(1) Query(Master)

Slave Address	Function	Starting Address		No. of Register		Byte Count	Data		Data		Error Check (CRC16)	
		High	Low	High	Low		High	Low	High	Low	Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

(2) Response(Slave)

Slave Address	Function	Starting Address		No. of Register		Error Check(CRC16)	
		High	Low	High	Low	Low	High
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

If write "10(A H)" in common to the range of Holding Register 400001(0000 H) to 400002(0001 H) on Slave side (Address 17) from Master side.

▪ Query(Master)

Slave Address	Function	Starting Address		No. of Register		Byte Count	Data		Data		Error Check (CRC16)	
		High	Low	High	Low		High	Low	High	Low	Low	High
11 H	10 H	00 H	00 H	00 H	02 H	04 H	00 H	0A H	00 H	0A H	## H	## H

▪ Response(Slave)

Slave Address	Function	Starting Address		No. of Register		Error Check(CRC16)	
		High	Low	High	Low	Low	High
11 H	10 H	00 H	00 H	00 H	02 H	## H	## H

Please use the Single Register Write function rather than Multi Register Write function if you use the slave(device) connecting with external devices such as PLC, Graphic Panel, except in the case of download that presets the minimum/maximum or basic value of parameter by Input specifications in PC Loader Program.

1.7 Exception Response-Error Code

If an error occurs, send a response command and transmit each Exception Code after set(1) the highest-level bit of received command(Function).

Slave Address	Function+80 H	Exception Code	Error Check(CRC16)	
			Low	High
1Byte	1Byte	1Byte	1Byte	1Byte

← CRC16 →

- ILLEGAL FUNCTION(Exception Code: 01 H): A command that is not supported.
- ILLEGAL DATA ADDRESS(Exception Code: 02 H): Starting address of queried data is inconsistent with transmittable address from the device.
- ILLRGAL DATA VALUE(Exception Code: 03 H): The number of queried data are inconsistent with the numbers of transmittable (transferable) data from the device.
- SLAVE DEVICE FAILURE(Exception Code: 04 H): Not properly completed the queried command (order).

Read the output status of non-existing coil 001001(03E8 H) [ON: 1, OFF: 0] on Slave side(Address 17) from Master side.

- Query (Master)

Slave Address	Function	Starting Address		No. of Points		Error Check(CRC16)	
		High	Low	High	Low	Low	High
11 H	01 H	03 H	E8 H	00 H	01 H	## H	## H

- Response (Slave)

Slave Address	Function+80 H	Exception Code	Error Check(CRC16)	
			Low	High
11 H	81 H	02 H	## H	## H

2 Modbus Mapping Table

2.1 Read Coils(Func01) / Write Single Coil(Func05)

No(Address)	Type	Description	Set range	Unit	Factory default
000001(0000)	RUN/STOP	Control output RUN/STOP	0: <i>rUn</i> 1: <i>StoP</i>	-	<i>rUn</i>
000002(0001)	Auto-tuning RUN/STOP	Auto-tuning RUN/STOP	0: <i>oFF</i> 0: <i>oN</i>	-	<i>oFF</i>
000003 to 000050	Reserved				

2.2 Read Discrete Inputs(Func02)

No(Address)	Type	Description	Set range	Unit	Factory default
100001(0000)	°C lamp	Unit display lamp	0: OFF 1: ON	-	-
100002(0001)	°F lamp		0: OFF 1: ON	-	-
100003(0002)	% lamp		0: OFF 1: ON	-	-
100004(0003)	OUT1 lamp	Control output1 display lamp	0: OFF 1: ON	-	-
100005(0004)	OUT2 lamp	Control output2 display lamp	0: OFF 1: ON	-	-
100006(0005)	AT lamp	Auto-tuning RUNlamp	0: OFF 1: ON	-	-
100007(0006)	SV1 lamp	Multi-SV1 lamp	0: OFF 1: ON	-	-
100008(0007)	SV2 lamp	Multi-SV2 lamp	0: OFF 1: ON	-	-
100009(0008)	SV3 lamp	Multi-SV3 lamp	0: OFF 1: ON	-	-
100010(0009)	AL1 lamp	Alarm output1 display lamp	0: OFF 1: ON	-	-
100011(000A)	AL2 lamp	Alarm output2 display lamp	0: OFF 1: ON	-	-
100012(000B)	AL3 lamp	Alarm output3 display lamp	0: OFF 1: ON	-	-
100013(000C)	MAN lamp	Manual control display lamp	0: OFF 1: ON	-	-
100014(000D)	DI-1 input	DI-1 input status	0: OFF 1: ON	-	-
100015(000E)	DI-2 input	DI-2 input status	0: OFF 1: ON	-	-
100016 to 100050	Reserved				

2.3 Read Input Registers(Func04)

No(Address)	Type		Set range	Unit	Factory default	Note
300001 to 300100	Reserved					
300101(0064)	-	Product number H	-	-	-	
300102(0065)	-	Product number L	-	-	-	
300103(0066)	-	Hardware version	-	-	-	
300104(0067)	-	Software version	-	-	-	
300105(0068)	-	Model name1	-	-	"KP"	
300106(0069)	-	Model name2	-	-	"N5"	
300107(006A)	-	Model name3	-	-	"3"	"Size"
300108(006B)	-	Model name4	-	-	"00"	"Control output"
300109(006C)	-	Model name5	-	-	"00"	"Option I/O"
300110(006D)	-	Model name6	-	-	" "	
300111(006E)	-	Model name7	-	-	" "	
300112(006F)	-	Model name8	-	-	" "	
300113(0070)	-	Model name9	-	-	" "	
300114(0071)	-	Model name10	-	-	" "	
300115(0072)	-	Reserved	-	-	-	
300116(0073)	-	Reserved	-	-	-	
300117(0074)	-	Reserved	-	-	-	
300118(0075)	-	Coil status start Address	-	-	0000	
300119(0076)	-	Coil status Quantity	-	-	0	
300120(0077)	-	Input status start Address	-	-	0000	
300121(0078)	-	Input status Quantity	-	-	0	
300122(0079)	-	Holding Register Start Address	-	-	0000	
300123(007A)	-	Holding Register Quantity	-	-	0	
300124(007B)	-	Input Register Start Address	-	-	0000	
300125(007C)	-	Input Register Quantity	-	-	0	
300127 to 300200	Reserved					
301001(03E8)	PV	Present value	-1999 to 9999	°C/°F/-	-	
301002(03E9)	-	Decimal point position	0: 0 1: 00 2: 000 3: 0000	-	-	
301003(03EA)	-	Display unit	0: °C 1: °F 2: °P 3: °FF	-	-	
301004(03EB)	SV	Set value	Within L-5u to H-5u	°C/°F/-	0000	
301005(03EC)	H-MV	Heating MV	0 to 1000 : H 00 to H 100	%	-	
301006(03ED)	C-MV	Cooling MV	0 to 1000 : C 00 to C 100	%	-	
301007(03EE)	°C lamp	Unit display lamp	0: OFF 1: ON	-	-	Bit 0
	°F lamp	Unit display lamp	0: OFF 1: ON	-	-	Bit 1
	% lamp	Unit display lamp	0: OFF 1: ON	-	-	Bit 2

No(Address)	Type		Set range	Unit	Factory default	Note
	OUT1 lamp	Control output1 display lamp	0: OFF 1: ON	-	-	Bit 3
	OUT2 lamp	Control output2 display lamp	0: OFF 1: ON	-	-	Bit 4
	AT lamp	Auto-tuning RUN lamp	0: OFF 1: ON	-	-	Bit 5
	SV1 lamp	Multi-SV1 lamp	0: OFF 1: ON	-	-	Bit 6
	SV2 lamp	Multi-SV2 lamp	0: OFF 1: ON	-	-	Bit 7
	SV3 lamp	Multi-SV3 lamp	0: OFF 1: ON	-	-	Bit 8
	AL1 lamp	Alarm output1 display lamp	0: OFF 1: ON	-	-	Bit 9
	AL2 lamp	Alarm output2 display lamp	0: OFF 1: ON	-	-	Bit A
	AL3 lamp	Alarm output3 display lamp	0: OFF 1: ON	-	-	Bit B
	MAN lamp	Manual control display lamp	0: OFF 1: ON	-	-	Bit C
	DI-1 input	DI-1 input status	0: OFF 1: ON	-	-	Bit D
	DI-2 input	DI-2 input status	0: OFF 1: ON	-	-	Bit E
301008(03EF)	-	Heater current value monitoring	0.0 to 50.0	-	-	

- Consists of the 31007(03EE) address bit data.

Bit F	Bit E	Bit D	Bit C	Bit B	Bit A	Bit 9	Bit 8
-	DI-2 input	DI-1 input	MAN lamp	AL3 lamp	AL2 lamp	AL1 lamp	SV4 lamp
0	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1
1 Byte							

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
SV3 lamp	SV2 lamp	AT lamp	OUT2 lamp	OUT1 lamp	% lamp	°F lamp	°C lamp
0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1
1 Byte							

2.4 Read Holding Register(Func03) / Write Single Register(Func06) / Write Multiple Registers(Func16)

2.4.1 SV setting, MV monitoring and manual control [Func: 03/06/16, RW: R/W]

- MV monitoring/ Manual control set group

No(Address)	Parameter	Description	Set range	Unit	Factory default
400001(0000)	SV	Set value	within L-SV to H-SV	°C/°F/-	0
400002(0001)	H-MV	Heating MV	0 to 1000: H 00 to H 100	%	-
400003(0002)	C-MV	Cooling MV	0 to 1000: C 00 to C 100	%	-
400004(0003)	-	Auto/Manual control	0: AUTO 1: MAN	-	AUTO
400005 to 400050	Reserved				

2.4.2 Parameter 1 group[Func: 03/06/16, RW: R/W]

No(Address)	Parameter	Description	Set range	Unit	Factory default
400051(0032)	r-S	Control output RUN/STOP	0: rUn 1: Stop	-	rUn
400052(0033)	SV-n	Multi-SV No.	0: SV-0 1: SV-1 2: SV-2 3: SV-3	-	SV-0
400053(0034)	Ct-A	Heater current value monitoring	0 to 500: 000 to 500 (display range)	A	-
400054(0035)	AL LL	Alarm output1 low-limit SV	Deviation alarm: -F.S to F.S Absolute alarm: within display range.	°C/°F/-	1550
400055(0036)	AL LH	Alarm output1 high-limit SV			1550
e	AL 2L	Alarm output2 low-limit SV			1550
d	AL 2H	Alarm output2 high-limit SV			1550
e	AL 3L	Alarm output3 low-limit SV			1550
d	AL 3H	Alarm output3 high-limit SV			1550
d	SV-0	SV-0 set value	within L-SV to H-SV	°C/°F/-	0000
dd	SV-1	SV-1 set value	within L-SV to H-SV	°C/°F/-	0000
d	SV-2	SV-2 set value	within L-SV to H-SV	°C/°F/-	0000
400063(003E)	SV-3	SV-3 set value	within L-SV to H-SV	°C/°F/-	0000
400064 to 400100	Reserved				

2.4.3 Parameter 2 group[Func: 03/06/16, RW: R/W]

No(Address)	Parameter	Description	Set range	Unit	Factory default
400101(0064)	Rt	Auto-tuning RUN/STOP	0 : OFF 1 : ON	-	OFF
400102(0065)	H-P	Heating, proportional band	1 to 9999: 000.1 to 9999	°C/°F/%	0.10.0
400103(0066)	C-P	Cooling, proportional band			
400104(0067)	H-I	Heating, integral time	0 to 9999: 0000 to 9999	sec.	0000
400105(0068)	C-I	Cooling, integral time			
400106(0069)	H-d	Heating, derivative time	0 to 9999: 0000 to 9999	sec.	0000
400107(006A)	C-d	Cooling, derivative time			
400108(006B)	db	Heating/Cooling, Dead band	-proportional band to 0.0 to +proportional band (based on small value of proportional band)	Digit	0000
			<ON/OFF – ON/OFF control> - 999 to 0999 (H) +999 to 9999 (L)		
			-9(9 to 09(9 (analog)	%F.S	000.0
400109(006C)	RESET	Proportional controlling, Manual reset	0 to 1000: 000.0 to 100.0	%	050.0
400110(006D)	HHYS	Heating, hysteresis	1 to 100: 0.1 to 100 (temperature H, analog) 1 to 1000: 000.1 to 100.0 (temperature L)	Digit	002
400111(006E)	HOSE	Heating, OFF offset	0 to 100: 0.0 to 100 (temperature H, analog) 0 to 1000: 000.0 to 100.0 (temperature L)	Digit	000
400112(006F)	CHYS	Cooling, hysteresis	1 to 100: 0.1 to 100 (temperature H, analog) 1 to 1000: 000.1 to 100.0 (temperature L)	Digit	002
400113(0070)	COSE	Cooling, OFF offset	0 to 100: 0.0 to 100 (temperature H, analog) 0 to 1000: 000.0 to 100.0 (temperature L)	Digit	000
400114(0071)	L-LV	MV low-limit set value	000.0 to H-LV - 0.1 (standard control) +100.0 to 000.0 (Heating/Cooling)	%	000.0 +100.0
400115(0072)	H-LV	MV high-limit set value	L-LV + 0.1 to 100.0 (standard control) 000.0 to 100.0 (Heating/Cooling)	%	100.0 100.0
400116(0073)	RAU	Lamp Up-change rate	0 to 999: 0.0 to 999 (temperature H, analog) 0 to 9999: 000.0 to 999.9 (temperature L)	Digit	000
400117(0074)	RAD	Lamp Down-change rate	0 to 999: 0.0 to 999 (temperature H, analog) 0 to 9999: 000.0 to 999.9 (temperature L)	Digit	0000
400118(0075)	RLT	Lamp time unit	0 : SEC 1 : MIN 2 : Hour	-	MIN
e	Reserved				

2.4.4 Parameter 3 group[Func: 03/06/16, RW: R/W]

No(Address)	Parameter	Description	Set range	Unit	Factory default
400151(0096)	Input type	Input type	Refer to the input type table.	-	ℓℓℓℓ
400152(0097)	Sensor temperature unit	Sensor temperature unit	0: °C 1: °F	-	°C
400153(0098)	Analog low-limit input value	Analog low-limit input value	Min. range to H-Limit - F.S10%	Digit	0000
400154(0099)	Analog high-limit input value	Analog high-limit input value	L-Limit + F.S10% to Max. range	Digit	1000
400155(009A)	Scale value decimal point position	Scale value decimal point position	0: 0 1: 0.0 2: 0.00 3: 0.000	-	0.0
400156(009B)	Scale low-limit display value	Scale low-limit display value	F.S	-	0000
400157(009C)	Scale high-limit display value	Scale high-limit display value	F.S	-	1000
400158(009D)	Front display unit	Front display unit	0: °C 1: °F 2: °C/°F 3: °F/°C	-	°C
400159(009E)	Input correction	Input correction	-999 to 999: -999 to 0999 -1999 to 9999: -1999 to 9999	Digit	0000
400160(009F)	Input digital filter	Input digital filter	1 to 1200: 000.1 to 1200	sec.	000.1
400161(00A0)	SV low-limit set value	SV low-limit set value	Input low-limit value (L-Limit) to H-Limit - 1 Digit	°C/°F %F.S	-200 0000
400162(00A1)	SV high-limit set value	SV high-limit set value	L-Limit + 1 Digit to input high-limit value (H-Limit)	°C/°F %F.S	1350 1000
400163(00A2)	Control output operation mode	Control output operation mode	Standard: 0: HEAT 1: COOL Heating/Cooling: 0: HEAT 1: COOL 2: H-C	HEAT H-C	HEAT H-C
400164(00A3)	Temperature control mode	Temperature control mode	Standard: 0: PID 1: ONOFF Heating/Cooling: 0: P.P 1: P.O.N 2: O.N.P 3: O.N.O.N	PID P.P	PID P.P
400165(00A4)	Auto-tuning mode	Auto-tuning mode	0: EUN1 1: EUN2	-	EUN1
400166(00A5)	OUT1 control output	OUT1 control output	0: rLg 1: 55r 2: CURr (1 output type) 0: 55r 1: CURr (2 output type)	-	rLg 55r
400167(00A6)	OUT1 current output range	OUT1 current output range	0: 4-20 1: 0-20	-	4-20
400168(00A7)	OUT2 control output	OUT2 control output	0: 55r 1: CURr	-	55r
400169(00A8)	OUT2 current output range	OUT2 current output range	0: 4-20 1: 0-20	-	4-20
400170(00A8)	Heating, control time	Heating, control time	1 to 1200: 000.1 to 1200	sec.	0200
400171(00AA)	Cooling, control time	Cooling, control time	1 to 1200: 000.1 to 1200	sec.	0200
400172 to 400200	Reserved				

2.4.5 Parameter 4 group[Func: 03/06/16, RW: R/W]

No(Address)	Parameter	Description	Set range	Unit	Factory default
400201(00C8)	AL-1	Alarm output1 mode	0: OFF 1: dULC 2: JJdu 3: JduC 4: CduJ 5: PuCC 6: JJPu 7: LbA 8: SbA 9: HbA	-	dULC
400202(00C9)	AL1t	Alarm output1 option	0: AL-A 1: AL-b 2: AL-C 3: AL-d 4: AL-E 5: AL-F	-	AL-A
400203(00CA)	ALHY	Alarm output1 hysteresis	1 to 100: 001 to 100 (temperature H, analog) 1 to 1000: 000.1 to 1000 (temperature L)	Digit	001
400204(00CB)	ALn	Alarm output1 N.O./N.C.	0: no 1: nC	-	no
400205(00CC)	ALon	Alarm output1 ON delay time	0 to 3600: 0000 to 3600	sec.	0000
400206(00CD)	ALoF	Alarm output1 OFF delay time	0 to 3600: 0000 to 3600	sec.	0000
400207(00CE)	AL-2	Alarm output2 mode	0: OFF 1: dULC 2: JJdu 3: JduC 4: CduJ 5: PuCC 6: JJPu 7: LbA 8: SbA 9: HbA	-	JJdu
400208(00CF)	AL2t	Alarm output2 option/type	0: AL-A 1: AL-b 2: AL-C 3: AL-d 4: AL-E 5: AL-F	-	AL-A
400209(00D0)	AL2HY	Alarm output2 hysteresis	1 to 100: 001 to 100 (temperature H, analog) 1 to 1000: 000.1 to 1000 (temperature L)	Digit	001
400210(00D1)	AL2n	Alarm output2 N.O./N.C.	0: no 1: nC	-	no
400211(00D2)	AL2on	Alarm output2 ON delay time	0 to 3600: 0000 to 3600	sec.	0000
400212(00D3)	AL2oF	Alarm output2 OFF delay time	0 to 3600: 0000 to 3600	sec.	0000
400213(00D4)	AL-3	Alarm output3 mode	0: OFF 1: dULC 2: JJdu 3: JduC 4: CduJ 5: PuCC 6: JJPu 7: LbA 8: SbA 9: HbA	-	LbA
400214(00D5)	AL3t	Alarm output3 option/type	0: AL-A 1: AL-b 2: AL-C 3: AL-d 4: AL-E 5: AL-F	-	AL-A
400215(00D6)	AL3HY	Alarm output3 hysteresis	1 to 100: 001 to 100 (temperature H, analog) 1 to 1000: 000.1 to 1000 (temperature L)	Digit	001
400216(00D7)	AL3n	Alarm output3 N.O./N.C.	0: no 1: nC	-	no
400217(00D8)	AL3on	Alarm output3 ON delay time	0 to 3600: 0000 to 3600	sec.	0000
400218(00D9)	AL3oF	Alarm output3 OFF delay time	0 to 3600: 0000 to 3600	sec.	0000
400219(00DA)	LbALt	LBA monitoring time	0 to 9999: 0000 to 9999	sec.	0000
400220(00DB)	Reserved				
400221(00DC)	LbALb	LBA detection band	1 to 9999: 001 to 999 (temperature H) 1 to 9999: 000.1 to 9999 (temperature L) 1 to 9999: 0001 to 9999 (analog)	°C/°F %F.S	003 003.0 0020
400222(00DD)	AO-n	Analog trans. output value	0: Pu 1: Su 2: H-nu 3: C-nu 4: LP5	-	Pu
400223(00DE)	F5-L	PV trans. output low-limit value	F.S	°C/°F/-	-200
400224(00DF)	F5-H	PV trans. output high-limit value	F.S		1350
400225(00E0)	Adr5	Communication address	1 to 127: 01 to 127	-	01
400226(00E1)	bP5	Communication speed	0: 24 1: 48 2: 96 3: 192 4: 384	X100bps	96
400227(00E2)	Prty	Communication parity bit	0: none 1: Even 2: odd	-	none
400228(00E3)	StP	Communication stop bit	0: 1 1: 2	Bit	2

No(Address)	Parameter	Description	Set range	Unit	Factory default
400229(00E4)	5.5	Communication response waiting time	5 to 99: 5 to 99	ms	20
400230(00E5)	5.6	Communication write enable/disable	0: EN 1: DI 5.6	-	EN
400225 to 400250	Reserved				

2.4.6 Parameter 5 group[Func: 03/06/16, RW: R/W]

No(Address)	Parameter	Description	Set range	Unit	Factory default
400251(00FA)	5.5	Number of Multi-SVs	0: 1 1: 2 2: 4	EA	1
400252(00FB)	5.7	Front DI input key function	0: OFF 1: RL 2: SETOP 3: RL RE	-	SETOP
400253(00FC)	5.8	DI-1 input terminal function	0: OFF 1: SETOP 2: RL RE 3: RRN 4: 5.5	-	OFF
400254(00FD)	5.9	DI-2 input terminal function	5: 5.5		
400255(00FE)	5.5	Remote SV	0: OFF 1: ON	-	OFF
400256(00FF)	5.6	Remote SV low-limit value correction	-999 to 999: -999 to 9999 -1999 to 9999: -1999 to 9999	-	0000
400257(0100)	5.6	Remote SV gradient correction	0.100 to 5.000: 0.100 to 5.000	-	1.000
400258(0101)	5.7	Bar graph	0: OFF 1: OUT 1 (standard) 0: OFF 1: OUT 1 2: OUT 2 3: ALL (heating/cooling)	-	OUT 1
400259(0102)		Manual control, initial MV	0: AUTO 1: PrMV	-	ALL
400260(0103)	5.5	Manual control, preset MV	0000 to 1000 (standard) -1000 to 1000 (heating/cooling)	%	OUT 0
400261(0104)	5.6	Sensor error, MV	0000 to 1000 (standard) -1000 to 1000 (heating/cooling)	%	0000
400262(0105)	5.6	Control stop, MV	0000 to 1000 (standard) -1000 to 1000 (heating/cooling)	%	0000
400263(0106)	5.6	Control stop, Alarm output	0: CONT 1: OFF	-	0000
400264(0107)	5.7	User group	0: STND 1: HIGH	-	CONT
400265(0108)	5.7	Parameter initialization	0: NO 1: YES	-	STND
400266(0109)	5.8	SV set group lock	0: OFF 1: ON	-	NO
400267(010A)	5.5	Parameter 1 group lock	0: OFF 1: ON	-	OFF
400268(010B)	5.6	Parameter 2 group lock	0: OFF 1: ON	-	OFF
400269(010C)	5.6	Parameter 3 group lock	0: OFF 1: ON	-	OFF
400270(010D)	5.6	Parameter 4 group lock	0: OFF 1: ON	-	OFF
400271(010E)	5.6	Parameter 5 group lock	0: OFF 1: ON	-	OFF
400272(010F)	5.6	Password	0000: OFF 0002 to 9999: Password set range (※ 0001: password for reading)	-	OFF
400273 to 400300	Reserved				

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* Dimensions or specifications on this manual are subject to change and some models may be discontinued without notice.