Make Life Easy

User Manual for Communication

Refrigeration Temperature Controller

TF3 Series

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.

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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

TF3 Series is accepted to Modbus RTU Protocol.

Broadcase command is not supportted.

User Manual for Communication Symbols

Symbol	Description
 **Note**	Supplementary information for a particular feature.
 **Warning**	Failure to follow instructions can result in serious injury or death.
 **Caution**	Failure to follow instructions can lead to a minor injury or product damage.
 **Ex.**	An example of the concerned feature's use.
※1	Annotation mark.

Safety Precautions

- Following these safety precautions will ensure the safe and proper use of the product and help prevent accidents, as well as minimizing possible hazards.
- Safety precautions are categorized as Warnings and Cautions, as defined below:

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

Caution	Caution	Failure to follow these instructions may result in personal injury or product damage.

Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
  Failure to follow this instruction may result in personal injury, fire, or economic loss.
- The unit must be installed on a device panel before use.
  Failure to follow this instruction may result in electric shock.
- Do not connect, repair, or inspect the unit while connected to a power source.
  Failure to follow this instruction may result in electric shock.
- Check the terminal numbers before connecting the power source.
  Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit. Please contact us if necessary.
  Failure to follow this instruction may result in electric shock or fire.

Caution

- Do not use the unit outdoors.
  Failure to follow this instruction may result in shortening the life cycle of the unit, or electric shock.
- When connecting the power input and relay output cables, use AWG 12 to 28 cables.
  Make sure to tighten the relay output terminal screw bolt 0.4N·m and the others communication and power terminal screw bolt 0.5N·m. When connecting the sensor input cables, use AWG 14 to 30 cables and make sure to tighten the terminal screw bolt 0.2N·m.
  Failure to follow this instruction may result in fire due to contact failure.
- Use the unit within the rated specifications.
  Failure to follow this instruction may result in shortening the life cycle of the unit, or fire.
- Do not use loads beyond the rated switching capacity of the relay contact.
  Failure to follow this instruction may result in insulation failure, contact melt, contact failure, relay broken, or fire.
- Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.
  Failure to follow this instruction may result in electric shock or fire.

- Do not use the unit where flammable or explosive gas, humidity, direct sunlight, radiant heat, vibration, or impact may be present.
  Failure to follow this instruction may result in fire or explosion.
- Keep dust and wire residue from flowing into the unit.
  Failure to follow this instruction may result in fire or product damage.

The specifications and dimensions of this manual are subject to change and some models may be discontinued without notice.

Table of Contents

1 Modbus RTU Protocol

1.1 Read Coil Status(Func01–01H)

Read output ON/OFF (OX reference, Coil) 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

The example of reading the 10 outputs status (ON: 1, OFF: 0) within Coil 000001(0000 H) to 000010(0009 H) on Slave(Address 17) from Master.

- 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

The example when Coil000008(0007 H) to 000001(0000 H) values are "ON-ON-OFF-OFF-ON-ON-OFF-ON", 000010(0009 H) to 000009(0008 H) values are "OFF-ON" on Slave.

- 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 (1X reference) ON/OFF on 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

The example of reading the 10 input stauts (ON: 1, OFF: 0) within 100001(0000 H) to 100010(0009 H) on Slave(Address 17) from Master.

- 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

The example when 100008(0007 H) to 100001(0000 H) values are " ON-ON-OFF-OFF-ON-ON-OFF-ON", 100010(0009 H) to 100009(0008 H) values are "OFF-ON" on Slave.

- Response(Slave)

Slave Address	Function	Byte Count	Data (100008 to 100001)	Data (100010 to 100009)	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 binary data of Holding Registers (4X reference) on 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

The example of reading 2 values within Holding Register 400001(0000 H) to 400002(0001 H) on Slave(Address 17) from 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

The example when 400001(0000 H) value is “555(22B H)”, 400002(0001 H) value is “100 (64 H)” on Slave.

- 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 binary data of Input Registers (3X reference) on 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

The example of reading 2 values within Input Register 300001(0000 H) to 300002(0001 H) on Slave(Address 17) from Master.

- 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

The example when 300001(0000 H) value is “10(A H)”, 300002(0001 H) value is “20(14 H)” on Slave.

- 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 Force Single Coil (Func 05–05H)

Turns ON (FF00 H) or OFF (0000 H) of single coil (0X reference) status within slave device.

(1) Query (Master)

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

CRC16

If Coil 000001 (0000 H) turns ON of 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	05 H	00 H	00 H	FFH	00 H	## H	## H

- Response (Slave)

Slave Address	Function	Starting Address		Preset Data		Error Check (CRC16)	
		High	Low	High	Low	Low	High
11 H	05 H	00 H	00 H	FF H	00 H	## H	## H

1.6 Preset Single Registers(Func06–06H)

Write binary data of single Holding Registers (4X reference) on 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

The example of writing “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

1.7 Preset Multiple Registers(Func16–10H)

Write binary data of continuous Holding Registers (4X reference) on 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

CRC16

(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

CRC16

The example of writing "10(A H)" to Holding Register 400001(0000 H) to 400002(0001 H) on Slave(Address 17) from Master.

- 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

When connecting external devices such as PLC, graphic panel, etc. except when downloading the preset parameters by input type at PC loader program, use Single Register Write, not Multi Register Write.

1.8 Exception Response-Error Code

When communication error occurs, send response command and transmit exception code after setting (1) the highest level bit of received command (Function).

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

CRC16

- ILLEGAL FUNCTION(Exception Code: 01 H): Not supported command
- ILLEGAL DATA ADDRESS(Exception Code: 02 H): Starting address of the requested data is inconsistent with transmittable address from the device.
- ILLRGAL DATA VALUE(Exception Code: 03 H): The requested number of data is inconsistent with the transmittable number of address.
- SLAVE DEVICE FAILURE(Exception Code: 04 H): Not properly complete the requested command.

The example of reading output stauts (ON: 1, OFF: 0) of Coil 001001(03E8 H) which does not exist on Slave(Address 17) from Master.

- 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 (Command)+80 H	Exception Code	Error Check(CRC16)	
			Low	High
11 H	81 H	02 H	## H	## H

2 Modbus Mapping Table

2.1 Read Coil Status.(Func 01) / Force Single Coil(Func 05) [Func: 01/05, R/W: R/W]

No(Address)	Parameter	Description	Setting range	Unit	Factory default	Note
000001(0000)	Enable AUX Output	Auxiliary output ON/OFF	0: oFF, 1: on	-	1	
000002(0001)	Enable Comp Output	Compressor output ON/OFF	0: oFF, 1: on	-	1	
000003(0002)	Parameter Initialize	Parameter reset	0: no, 1: YES	-	0	
000004 to 000050	Reserved					

2.2 Read Input Status.(Func 02) [Func: 02, R/W: R]

No(Address)	Parameter	Description	Setting range	Unit	Factory default	Note
100001(0000)	℃ indicator	Unit indicator	0: OFF, 1: ON	-	-	
100002(0001)	℉ indicator	Unit indicator	0: OFF, 1: ON	-	-	
100003(0002)	COMP indicator	Compressor output indicator	0: OFF, 1: ON	-	-	
100004(0003)	DEF indicator	Defrost output indicator	0: OFF, 1: ON	-	-	
100005(0004)	FAN indicator	Evaporation-fan output indicator	0: OFF, 1: ON	-	-	
100006(0005)	AUX indicator	Auxiliary output indicator	0: OFF, 1: ON	-	-	
100007(0006)	▲ indicator	Deviation indicator	0: OFF, 1: ON	-	-	
100008(0007)	■ indicator	Deviation indicator	0: OFF, 1: ON	-	-	
100009(0008)	▼ indicator	Deviation indicator	0: OFF, 1: ON	-	-	
100010(0009)	DI input	Digital input	0: OFF, 1: ON	-	-	
100011 to 100050	Reserved					

2.3 Read Input Register.(Func 04) [Func: 04, R/W: R]

No(Address)	Parameter	Description	Setting range	Unit	Factory default	Note
300001(0000) to 300100(0063)	Reserved					
300101(0064)	-	Product number H	-	-	0	
300102(0065)	-	Product number L	-	-	2563	
300103(0066)	-	Hardware version	-	-		
300104(0067)	-	Software version	-	-		
300105(0068)	-	Model name 1	-	-	“TF”	
300106(0069)	-	Model name 2	-	-	“3□”	
300107(006A)	-	Model name 3	-	-	“-□”	
300108(006B)	-	Model name 4	-	-	“□□”	
300109(006C)	-	Model name 5	-	-	“-□”	
300110(006D)	-	Model name 6	-	-	“ ”	
300111(006E)	-	Model name 7	-	-	“ “	
300112(006F)	-	Model name 8	-	-	“ “	
300113(0070)	-	Model name 9	-	-	“ “	
300114(0071)	-	Model name 10	-	-	“ “	
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	
300126(007D)	-	Channel Quantity	-	-	0	
300127(007E) to 300200(00C7)	Reserved					

No(Address)	Parameter	Description	Setting range	Unit	Factory default	Note
301001(03E8)	PV	Present value	SV low limit to SV high limit, 30001: oPEn 30000: HHHH (High) -30000: LLLL (Low)	℃/℉	-	
301002(03E9)	SV	SV setting value	SV low limit to SV high limit	℃/℉	0	
301003(03EA)	dP.t	Display selection	0: S1, 1: S2, 2: S3, 3: uS	-	0	
301004(03EB)	Unt	TemperatureUnit	0: °C, 1:°F	-	0	
301005(03EC)	Fa.t	Monitoring time	0 to 100	Hour	-	
301006(03ED)	H.PV	Max. temperature value	SV low limit to SV high limit	℃/℉	-	
301007(03EE)	L.PV	Min. temperature value	SV low limit to SV high limit	℃/℉	-	
301008(03EF)	℃ indicator	Unit indicator	0: OFF, 1: ON	-	-	Bit 0
	℉ indicator	Unit indicator	0: OFF, 1: ON	-	-	Bit 1
	COMP indicator	Compressor output indicator	0: OFF, 1: ON	-	-	Bit 2
	DEF indicator	Defrost output indicator	0: OFF, 1: ON	-	-	Bit 3
	FAN indicator	Evaporation-fan output indicator	0: OFF, 1: ON	-	-	Bit 4
	AUX indicator	Auxiliary output indicator	0: OFF, 1: ON	-	-	Bit 5
	▲ indicator	Deviation indicator	0: OFF, 1: ON	-	-	Bit 6
	■ indicator	Deviation indicator	0: OFF, 1: ON	-	-	Bit 7
	▼ indicator	Deviation indicator	0: OFF, 1: ON	-	-	Bit 8
	DI input	Digital input	0: OFF, 1: ON	-	-	Bit 9
301009	S1_Temperature	Input sensor 1 temperature value	SV low limit to SV high limit	℃/℉		
301010	S2_Temperature	Input sensor 2 temperature value	SV low limit to SV high limit	℃/℉		
301011	S3_Temperature	Input sensor 3 temperature value	SV low limit to SV high limit	℃/℉		
301012	Virtual temperature	Virtual temperature value	SV low limit to SV high limit	℃/℉		
301013	Decimal point	Decimal point position	0: 0, 1: 0.0			
302001	TFD_1st digit data	Data value of TFD_10^3		-	-	
302002	TFD_2nd digit data	Data value of TFD_ 10^2		-	-	
302003	TFD_3rd digit data	Data value of TFD_ 10^1		-	-	
302004	TFD_output data	TFD output indicator data value		-	-	

2.4 Read Holding Register(Func 03) / Preset Single Register(Func 06) / Preset Multiple Registers(Func 16) [Func: 03/06/16, R/W: R/W]

2.4.1 SV setting group

No(Address)	Parameter	Description	Setting range	Factory default	Unit	Note
400001(0000)	SV	SV setting	SV low limit value to SV high limit value	0	℃/℉	
400002(0001)	dP.t	Display selection	0: SV1, 1: SV2, 2: SV3, 3: uS	0	-	
400007 to 400050	Reserved					

2.4.2 Parameter User Group (Parameter 0 Group)

No(Address)	Parameter	Description	Setting range	Factory default	Unit	Note
400051(0032)	mon.t	Monitoring time	0 to 100	-	Hour	
400052(0033)	H.Pv	Max. value	SV low limit value to SV high limit value	-	℃/℉	
400053(0034)	L.Pv	Min. value	SV low limit value to SV high limit value	-	℃/℉	
400054 to 400100	Reserved					

2.4.3 Parameter 1 Setting Group

No(Address)	Parameter	Description	Setting range	Factory default	Unit	Note
400101(0064)	In t	Input type	0: n S.H, 1: n S.L, 2: n 1H, 3: n 1L, 4: dP.H, 5: dP.L	0	-	
400102(0065)	S2	Input sensor 2 ON/OFF	0: oFF, 1: on	0	-	
400103(0066)	S3	Input sensor 3 selection	0: dI, 1: tS	0	-	
400104(0067)	vt.r	Virtual temperature rate	0 to 100	0	%	
400105(0068)	Unt	Temperature unit	0: °C, 1: °F	0	-	
400106(0069)	I b.1	Input correction 1	-40 to 40.0	0.0	°C/°F	
400107(006A)	I b.2	Input correction 2				
400108(006B)	I b.3	Input correction 3				
400109(006C)	dS.t	Delay display period	0.5 to 10.0	0.5	Sec	
400110(006D)	S.dA	Defrost/Auxiliary output	0: dEF, 1: AUX	0	-	
400111(006E)	AUX	Auxiliary output	0: oFF, 1: FAn, 2: ALn	0	-	
400112(006F)	bUZ	Buzzer	0: oFF, 1: on	1	-	
400112 to 400150	Reserved					

2.4.4 Parameter 2 Setting Group

No(Address)	Parameter	Description	Setting range	Factory default	Unit	Note
400151(0096)	oFt	Compressor output mode	0: C, 1: H	0	-	
400152(0097)	HYS	Hysteresis	1 to 5 (0.5 to 5.0)	1	°C	
			2 to 10 (2.0 to 10.0)		°F	
400153(0098)	oFS	Offset	0 to 5 (0.0 to 5.0)	0	°C	
			0 to 10 (0.0 to 10.0)		°F	
400154(0099)	HSu	SV high limit value	(SV low limit +1 digit) to high limit value of input type	99	°C/°F	
400155(009A)	LSu	SV low limit value	Low limit value of input type to (SV high limit -1 digit)	-40	°C/°F	
400156(009B)	n.nd	Night mode	0: oFF, 1: Et n, 2: dI	0	°C/°F	
400157(009C)	n.Su	Night mode SV correction	-20 to 20 (-20 to 20.0)	1	°C	
			-50 to 50 (-50 to 50.0)		°F	
400158(009D)	n.HY	Night mode hysteresis	1 to 5 (0.5 to 5.0)	1	°C	
			2 to 10 (2.0 to 10.0)		°F	
400159(009E)	n.oF	Night mode offset	0 to 5 (0.0 to 5.0)	0	°C	
			0 to 10 (0.0 to 10.0)		°F	
400160(009F)	nSH	Night mode start hour	0 to 23	0	Hour	
400161(00A0)	nSn	Night mode start min	0 to 59	0	Min	
400162(00A1)	nEH	Night mode end hour	0 to 23	8	Hour	
400163(00A2)	nEn	Night mode end min	0 to 59	0	Min	
400164(00A3)	E.no	Temperature monitoring	0: oFF, 1: S1, 2: S2, 3: S3, 4: uS	0	-	
400165(00A4)	SdL	Compressor start-up delay time	0 to 60	0	Min	
400166(00A5)	CYC	Compressor min. operation cycle	0 to 60	0	Min	
400167(00A6)	rdL	Compressor restart delay time	0 to 60	0	Min	
400168(00A7)	ont	Compressor min. operation time	0 to 60	0	Min	
400169(00A8)	CC	Compressor continuous operation	0 to 24	0	Hour	
400170(00A9)	Ad.C	Alarm delay time after continuous operation	0 to 24	2	Hour	
400171(00AA)	CLE	Compressor operation cylce when sensor break	0 to 100	0	Min	
400172(00AB)	dUt	Compressor duty rate when sensor break	0 to 100	50	%	
400173 to 400250	Reserved					

2.4.5 Parameter 3 Setting Group

No(Address)	Parameter	Description	Setting range	Factory default	Unit	Note
400201(00C8)	dEF	Defrost method & operation	0: HtM, 1: GtM, 2: HtE, 3: GtE	0	-	
400202(00C9)	dIn	Defrost cycle	0 to 24, 0 to 100	4	Hour	
400203(00CA)	r.dI	Real-time defrost cycle	0: oFF, 1: on	0	-	
400204(00CB)	dH1	Real-time defrost cycle 1: hour	0 to 23, 24: oFF	24	Hour	
400205(00CC)	dn1	Real-time defrost cycle 1: min	0 to 59, 60: oFF	60	Min	
400206(00CD)	dH2	Real-time defrost cycle 2: hour	0 to 23, 24: oFF	24	Hour	
400207(00CE)	dn2	Real-time defrost cycle 2: min	0 to 59, 60: oFF	60	Min	
400208(00CF)	dH3	Real-time defrost cycle 3: hour	0 to 23, 24: oFF	24	Hour	
400209(00D0)	dn3	Real-time defrost cycle 3: min	0 to 59, 60: oFF	60	Min	
400210(00D1)	dH4	Real-time defrost cycle 4: hour	0 to 23, 24: oFF	24	Hour	
400211(00D2)	dn4	Real-time defrost cycle 4: min	0 to 59, 60: oFF	60	Min	
400212(00D3)	dH5	Real-time defrost cycle 5: hour	0 to 23, 24: oFF	24	Hour	
400213(00D4)	dn5	Real-time defrost cycle 5: min	0 to 59, 60: oFF	60	Min	
400214(00D5)	dH6	Real-time defrost cycle 6: hour	0 to 23, 24: oFF	24	Hour	
400215(00D6)	dn6	Real-time defrost cycle 6: min	0 to 59, 60: oFF	60	Min	
400216(00D7)	dH7	Real-time defrost cycle 7: hour	0 to 23, 24: oFF	24	Hour	
400217(00D8)	dn7	Real-time defrost cycle 7: min	0 to 59, 60: oFF	60	Min	
400218(00D9)	dH8	Real-time defrost cycle 8: hour	0 to 23, 24: oFF	24	Hour	
400219(00DA)	dn8	Real-time defrost cycle 8: min	0 to 59, 60: oFF	60	Min	
400220(00DB)	dEt	Defrost time	1 to 100	30	Min/Sec	
400221(00DC)	Pd.d	Pump down delay time	0.00 to 9.59 (0 min. 00 sec. to 9 min. 59 sec.)	0.00	Min.Sec	
400222(00DD)	dr.t	Defrost end delay time	0.00 to 9.59 (0 min. 00 sec. to 9 min. 59 sec.)	1.00	Min.Sec	
400223(00DE)	Edt	Defrost end temperature	-40 to 99	4	℃	
			-40 to 212		℉	
400224(00DF)	dHy	Defrost hysteresis	1 to 5 (0.5 to 5.0)	1	℃	
			2 to 10 (2.0 to 10.0)		℉	
400225(00E0)	P.dE	Defrost when power ON	0: oFF, 1: on	0	-	
400226(00E1)	d.dE	Defrost delay when power ON/manual defrost	0 to 60	0	Min	
400227(00E2)	d.Gr	Defrost group	0: oFF, 1: nAS, 2: SLu	0	-	
400228(00E3)	P.dC	Parameter copy	0: oFF, 1: on	0	-	
400229(00E4)	d.Pr	Prior defrost selection	0: oFF, 1: on	0	-	
400230(00E5)	U.dE	Defrost time unit	0: HGH, 1: LoY	0	-	
400231(00E6)	Rd.d	Alarm delay after defrost/door open	0 to 24	1	Hour	
400232(00E7)	t.dE	Temperature display during defrosting	0: oFF, 1: on	0	-	

No(Address)	Parameter	Description	Setting range	Factory default	Unit	Note
400233(00E8)						
400234 to 400250	Reserved					

2.4.6 Parameter 4 Setting Group

No(Address)	Parameter	Description	Setting range	Factory default	Unit	Note
400251(00FA)	AL	Alarm operation mode	0: oFF, 1: AL.d	1	-	
400252(00FB)	AL.t	Alarm option	0: AL.A, 1: AL.b, 2: AL.C, 3: AL.d, 4: AL.E, 5: AL.F	0	-	
400253(00FC)	AL.H	Alarm high-limit deviation	-F.S to F.S	139	℃	
				252	℉	
400254(00FD)	AL.L	Alarm low-limit deviation	-F.S to F.S	139	℃	
				252	℉	
400255(00FE)	A.HY	Alarm hysteresis	1 to 5 (0.5 to 5.0)	1	℃	
			2 to 10 (2.0 to 10.0)		℉	
400256(00FF)	A.on	Alarm ON delay time	0 to 60	0	Min	
400257(0100)	A.oF	Alarm OFF delay time	0 to 60	0	Min	
400258(0101)	E.Ad	External alarm delay time	0 to 60	0	Min	
400259(0102)	A.n	Alarm output method	0: no, 1: nC	0	-	
400260(0103)	F.tY	Evaporation-fan operation	0: FAn, 1: dEF	0	-	
400261(0104)	F.t	Evaporation-fan control temperature	-40 to 99	4	℃	
			-40 to 212		℉	
400262(0105)	F.HY	Evaporation-fan hysteresis	1 to 5 (0.5 to 5.0)	1	℃	
			2 to 10 (2.0 to 10.0)		℉	
400263(0106)	FAn	Evaporation-fan mode	0: EF 1, 1: EF2, 2: EF3, 3: EF4, 4: EF5	0	-	
400264(0107)	P.dr	Evaporation-fan start-up delay time	0.00 to 9.59	0.00	Min.Sec	
400265 to 400300	Reserved					

2.4.7 Parameter 5 Setting Group

No(Address)	Parameter	Description	Setting range	Factory default	Unit	Note
400301(012C)	CUH	Current hour	0 to 23	Random hour	Hour	
400302(012D)	CUn	Current min	0 to 59	Random min.	Min	
400303(012E)	dI	Digital input	0: oFF, 1: StP, 2: d.SY, 3: n.nd, 4: E.AL, 5: E.dF, 6: n.dF	0	-	
400304(012F)	LbA	Loop break alarm monitoring time	0 to 100	0	Min	
400305(0130)	Adr	Communication address	01 to 99	01	-	
400306(0131)	bPS	Communication speed	0: 24, 1: 48, 2: 96, 3: 192, 4: 384	2	bps	
400307(0132)	Prt	Communication parity bit	0: non, 1: Eun, 2: odd	0	-	
400308(0133)	StP	Communication stop bit	0: 1, 1: 2	1	-	
400309(0134)	rSt	Communication response wait time	5 to 99	20	ms	
400310(0135)	CoY	Communication write	0: EnA, 1: dSA	0	-	
400311(0136)	USr	User level	0: Std, 1: HGH	0	-	
400312(0137)	LSu	SV setting group lock	0: oFF, 1: on	0	-	
400313(0138)	LdE	Front key lock	0: oFF, 1: on	0	-	
400314(0139)	LP0	Parameter 0 group lock	0: oFF, 1: on	0	-	
400315(013A)	LPU	Parameter user group lock	0: oFF, 1: on	0	-	
400316(013B)	LP1	Parameter 1 group lock	0: oFF, 1: on	0	-	
400317(013C)	LP2	Parameter 2 group lock	0: oFF, 1: on	0	-	
400318(013D)	LP3	Parameter 3 group lock	0: oFF, 1: on	0	-	
400319(013E)	LP4	Parameter 4 group lock	0: oFF, 1: on	0	-	
400320(013F)	LP5	Parameter 5 group lock	0: oFF, 1: on	0	-	
400321(0140)	PYd	Password	000: Password OFF 002 to 999: Password ON	000	-	
400322 to 400350	Reserved					

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

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