Autonics				S Nadal	pecifica	tions
Refrigera	ation Tempe	eratu	re Controller	Power	AC pow	/er 100-
Т	C3YF S	FR	IFS	supply	DC pow	/er 12-2
				Power	AC pow	er Max.
INS	TRUCITO) N	MAUAL	Display	nption DC pow	/er Max. 7 Set
	The second second second	and the	7/	Charac	ter size (W×H)	7.4×
	TC3YF Autom		1	Input ty	rpe ne resistance	Allow
				Sampli	ng period	500n
		MD		Display	accuracy	• At r • Out
	C.			Control	Compressor (CC	MP) 250V
Thanl	k you for choosing c	our Auto	nics product.	output	Defrost (DEF)
Please read th	ne following safety	consid	lerations before use.	Control	method	ON/C
Safety Considerati	ons			Hystere	esis	0.5 to
Please observe all safety of \$\langle \begin{bmatrix} \langle \begin{bmatrix} \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	tion due to special circun	nd proper nstances	product operation to avoid hazards. in which hazards may occur.	Relav	Compressor (CC	(250) (MP)
Warning Failure to for	llow these instructions m	ay result	in serious injury or death.	life cycle	Defrost (DEF) (250)
Caution Failure to fol	low these instructions ma	ay result i	n personal injury or product damage.		Evaporator-fan (F	FAN) Mech (250)
A Warning				Memor	y retention	Appr
. Fail-safe device must be in:	stalled when using the ur	nit with m	achinery that may cause serious injury	Dielect	ric strength	2000
or substantial economic los railways, aircraft, combusti	ss. (e.g. nuclear power co ion apparatus, safety equ	ontrol, me ipment, c	dical equipment, ships, vehicles, rime/disaster prevention devices, etc.)	Vibratio	Mechan	nical 0.75n
Failure to follow this instruction. Install on a device panel to	on may result in fire, persor use.	nal injury, o	or economic loss.	Noise	AC pow	uon 0.5m /er Squa
Failure to follow this instruction Do not connect, repair, or in	on may result in electric sho nspect the unit while con	ock or fire. nected to	a power source.	resistar	nce DC pow	/er Squa
Failure to follow this instruction	on may result in electric sho e wiring.	ock or fire.		Environ	Ambien tempera	tature -10 to
Do not disassemble or moo	on may result in fire. dify the unit.				Ambien humidit	t y 35 to
Coution	on may result in electric sho	DCK OF fire.		Protect	ion structure	IP65
When connecting the neuro	r innut and relay output		28~12 cable and tighten the terminal	Approv	al AC pow	ver RN
screw with a tightening tor	que of 0.3~0.4N·m.	ion cable	without dedicated cable use AWC	Weight	×2	Appr
28~16 cable and tighten the Failure to follow this instruction	e terminal screw with a tig	phtening t	orque of 0.3~0.4N·m.	※1: RT ※2: The	D input type is e weight includ	option. les packagi
 Use the unit within the rate Failure to follow this instruction 	d specifications.	uct dama	16.	mo XEnviro	del specificatio onment resista	on and option on and option of the second seco
 Use dry cloth to clean the u Failure to follow this instruction 	unit, and do not use water on may result in electric sho	or or organ	ic solvent.	Pa	art Desc	riptio
 Do not use the unit in the p radiant heat, vibration, imp 	lace where flammable/ex act, or salinity may be pro	plosive/co esent.	prrosive gas, humidity, direct sunlight,		1	-
Ordering Infor TC 3 Y F - 1	mation	ut (=			Tressor (COM	5 6
		^m −R	Relay output	Turns	ON for compre	essor outpu
	Power supply	1	12-24VDC 100-240VAC 50/60Hz	5. Evap	orator-fan (FA	N) output
	Control output for	1	Compressor output	6. Unit	indicator (°C, °	°F): Display
	refrigeration	2	Compressor+Defrost output	8. A , T	key :Used for	or changing
		3	Compressor+Defrost+Evaporator-fan	Hold	the 🔺 key for	3 sec in R
Control	mode		Freezing	: 🔳 D	imensio	ons
Size			DIN W72y H36mm	1 🗄	72	
Digits				1 6		
Item		3	aaa (3 digit)]	▫▫Ểᡱ	≝⊟∥
L		-TC	remperature Controller		000	
Input Type and	d Temperature	Ran		Pane	I cut-out	~
nput type	emperature range (°C)		Temperature range (°F)	il I	Min	. 91
hermistor (5kΩ) -4	10.0 to 99.9		-40 to 212	. 49		
TD (DPt 100Ω) ^{**1} -9	99.9 to 99.9		-148 to 212	Mi Fi		68+0.7
Connections						
	FAN OUT: D	EF OUT:	COMP OUT: 250VAC 5A	■ S'	V Settin	g
	30VDC 5A 25 RESISTIVE LOAD RESIS	UVAC 10A STIVE LOA	30VDC 5A D RESISTIVE LOAD	R	UN mode	E.g.) Cł ≫lf the
	ا لرما	لمره			↓ MD	it will
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		 7	8 9 10 11		<u> </u>	
		⊖ 7	8 9 10 11		0.0	,▼
		<i>⊡</i> 7			0.0], ▼
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SENSOR N		○ 7	8 9 10 11 5 0 10 11 5 0 10 11 10 1 1 10 1 1	■ Fa • sv s	actory D)efaul
SENSOR N Use crimp terminals of size spo	B ¹ B ¹ B ¹ B ¹ B ¹ C C C C C C C C C C C C C	<u> </u>	8 9 10 11 5 5 10 11 6 10 11 7 10 11 10 10 10 11 10 10 10 10 10 10 10 10	Faram	actory D ietting eter Default)efaul
Use crimp terminals of size spectrum	B' C C C C B' B' C	7	8 9 10 11 SOURCE A 100-240VAC 4VA 50/60Hz 12-24VDC 8W	Fa	actory D actory D setting leter Default u 0.)efaul
Use crimp terminals of size spe C Crimp terminal Triminal number la	B' C	7	8 9 10 11 SOURCE A 100-240VAC 4VA 50/60Hz 12-24VDC 8W	Faram Param Param Param	actory D actory D etting eter Default meter 1 grou eter Default)efaul
Use crimp terminals of size spectrum Crimp terminals of size spectrum Cr	Image: state	7	B 9 10 11 	• SV S Param • Para Param Param	actory D etting eter Default meter 1 gro eter Default 55 L	Defaul
Use crimp terminals of size spot <pre></pre>	B' C	orme mod	esis may be discontinued without notice.	Face SV S Param S Param Param H5 dl dE	actory D ietting ieter Default iu 0. meter 1 grou leter Default is 0. meter 1 grou leter 0. is 0.	

r / able vo r mptior			1			
y able vo r mptior	AC power	100-240VAC \sim 50/60Hz				
able vo r mptior	DC power	12-24VDC==				
r mptior	oltage range	90 to 110% of rated voltag	e			
inptior	AC power	Max. 4VA (100-240VAC 50	nouHz)			
	bod	T Segment L CO	ed)			
iy met		7 June 12 June	eu)			
turer si	~~ (vv×H)		00			
ype	sistanco	Allowable line resist	s max 50 and -			
ling -	eriod	500ms	per a wir	-		
y pe		• At room temp (22 ±=00)	(PV ±0.5% or 1°C	select the h	aher one' rd-	±1diait
у ассі	uracy	• Out of room temp. (25 ±5 °C):	: (PV ±0.5% or 1°C.	select the h	igher one) rdg	±1℃
Com	npressor (COMP)	250VAC~ 5A, 30VDC=	5A, 1a			
Def	frost (DEF)	_	250VAC~ 10A 1a			
	norator fon (EANI)			2501	AC~ 54 2011	DC- 5A 10
	hod	ON/OFF control		2301		20 JA, 18
resis		0.5 to 5.0°C 2 to 50°F vari	able			
		Mechanical: Min 20 000 0	00 operations Fler	trical: Min 5	0.000 operati	ons
Corr	npressor (COMP)	(250VAC 5A resistive load)		-,000 operall	
Def	frost (DFF)	Mechanical: Min. 20,000,0	00 operations, Elec	trical: Min. 1	00,000 opera	tions
Del		(250VAC 10A resistive loa	d)			
Evap	porator-fan (FAN)	Mechanical: Min. 20,000,0 (250VAC 54 resistive load	UU operations, Elec	trical: Min. 5	0,000 operati	ons
rv rete	ention	Approx. 10 years (non-yol-	/ atile memory metho	d)		
tion ro	sistance	100MO (at 500\/DC mood	er)	~/		
tric et	renath	2000VAC 60Hz for 1 min (between all externs	l terminals a	nd case)	
	Mechanical	0.75mm amplitude at frequer	icy of 10 to 55Hz /for	1 min) in each	X Y 7 directiv	on for 2 hour
on	Malfunction	0.5mm amplitude at frequen	cv of 10 to 55Hz (for	1 min) in each	X, Y, Z direction	on for 10 min
	AC nower	Square-wave noise by the p	nise simulator (pulco	width 1101 +	kV R-nhase o	nd S-nhaee
ance	DC nower	Square-wave noise by the n	nise simulator (pulse	width: 1) ±2	00V R-nhaeo	and S-nhace
	Ambiant	oquare-wave noise by the ho	nae simulator (puise	wiαui. 1μS)±5	ouv rt-priase	anu o-phase
	temperature	-10 to 50°C, storage: -20 to	o 60°C			
nmen	Ambient	25 to 95% DLL at 05	to 95% DU			
	humidity	งอ เข ชอ‰RH, storage: 35	10 85%RH			
ction s	tructure	IP65 (front part, IEC Stand	lards)			
	AC power	e 🕄 us 🕼 (except RTD optio	on models)			
val	DC power					
nt ^{≈2}		Approx. 229g(Approx. 143	g)			
TD inp	out type is optio	n.				
ne wei	ight includes pa	ckaging. The weight in par	entheses is for unit	only. The we	eight may be	varied by
ironme	ent resistance is	rated at no freezing or cor	ndensation.			
lart	Descrit	tion				
npres	3 4 5 sor (COMP) or	6 7 Itput indicator:	ion operation not o	ompressor	utout	
rost (F	DEF) output in	dicator: Turns ON for defr	ost output. Flashes	for defrost d	elay operation	n.
porate	or-fan (FAN) o	utput indicator:		-		
is ON	for Evaporator	fan output. Flashes for del	ay operation of Eva	porator-fan o	output.	
Indic	ator (°C, °F): D	isplays temperature unit	eturning DLIN mod-	moving	meter or coul-	ag SV/
∣ key: ▼ ko	v : Used for ch	y parameter setung group, h anging SV of parameter cot	tina	moving para	meter or savir	ıy 3V.
the D	kev for 3 ser	in RUN mode to execute/c	stop manual defroet	í.		
			p manuai ueir0si	-		(unit
)im	ensions	i				(unit: mm
	72		77			(unit: init
				1		(unit: mit
						(unit mi
	ا ۱ ۱ ۲ ۲ ۲ ۱۳۱۹ ۲					(unic mi
	274					(unit: min
	PII			8		(and mit
	214			30		(unic mi
			• Bracket	30		(une nu
el cut	-out Min. 91		• Bracket			(une nu
el cut	t-out		•Bracket		6	(une nu
el cut	t-out		• Bracket		6	(une nu
el cut	-out Min. 91		• Bracket		6	(une nu
el cut	-out Min. 91		• Bracket		19 14 15	
el cut			• Bracket		9 14.5	(0.0.10
el cut			• Bracket			
el cut	-out Min. 91		• Bracket		14.5	
el cut	H-out Min. 91	3.) Changing SV from 0.0 to	• Bracket			tting mode
	Hout Min. 91	3.) Changing SV from 0.0 t f there is no additional key twill be automatically return	• Bracket • Bracket • C • C • C • C • C • C • C • C	Sec after er	ه ۲ ۱tering into se	tting mode,
	Fout Min. 91	3.) Changing SV from 0.0 to f there is no additional key t will be automatically retur Press the 🛆 or 🔍 key to cl	• Bracket • Bracket • Bracket • 0-10.0 operation within 30 ned to RUN mode. hange SV continuo	sec after er	Tering into se	tting mode,
el cut	A-out Min. 91 Getting Min. 91 Getting Setting	3.) Changing SV from 0.0 to f there is no additional key t will be automatically retur Press the A or N key to cl thigh speed.	• Bracket • Bracket • D-10.0 operation within 30 ned to RUN mode. hange SV continuou) sec after er	tering into se	tting mode,
el cut	F-out Min. 91 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	g.) Changing SV from 0.0 th f there is no additional key t will be automatically retur Press the A or P key to ch at high speed.	• Bracket • Bracket • 0 • -10.0 operation within 30 ned to RUN mode. hange SV continuou	sec after er	o tering into se is increased/	tting mode,
el cut	Hout Min. 91 6 6 6 6 6 6 6 6 6 6 6 6 6	g.) Changing SV from 0.0 to the fit face is no additional key t will be automatically retur Press the a or r key to cl at high speed.	• Bracket • Bracket • 0 • -10.0 operation within 30 operation within 30 hange SV continuou) sec after er	tering into se	tting mode,
el cut	Cout Min. 91	g.) Changing SV from 0.0 t ff there is no additional key t will be automatically retur t will be automatically retur t high speed.	• Bracket • Bracket • C • C • C • C • C • C • C • C) sec after er	Itering into se	tting mode,
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el cut	A Content of the second	g.) Changing SV from 0.0 t ff there is no additional key t will be automatically retur Press the a or v key to cl thigh speed.	• Bracket • Bracket • 0.00 operation within 30 ned to RUN mode. hange SV continuou 0.5 sec in turn) sec after er usly, number	o (9 4 Itering into se is increased/	tting mode,
el cut	Cout Min. 91 Setting Mo Su Su Su Su Su Su Su Su Su Su Su Su Su	g.) Changing SV from 0.0 th ff there is no additional key t will be automatically retur Press the 🛆 or 🔍 key to cl at high speed.	• Bracket • Bracket • 00 • -10.0 • -10.0 • -10.0 • operation within 30 ned to RUN mode. hange SV continuou 0.5 sec in turn) sec after er usly, number	o tering into se is increased/	tting mode,
el cut	Hout Min. 91 6 Setting MD 5	g.) Changing SV from 0.0 to f there is no additional key t will be automatically retur Press the a or rkey to cl at high speed. Flashes MD ault	• Bracket • Bracket • 00 • 00 • -10.0 • 00 • -10.0 • 00 • 00) sec after er usly, number	tering into se	itting mode,
el cut	Hout Min. 91 6 6 6 6 6 6 6 6 6 6 6 6 6	g.) Changing SV from 0.0 to ff there is no additional key twill be automatically return Press the (a) or () key to ch at high speed.	• Bracket • Bracket • C • C • C • C • C • C • C • C) sec after er usly, number	tering into se	tting mode,
el cut	-out Min. 91 -out Min. 91 -out	g.) Changing SV from 0.0 to ff there is no additional key t will be automatically retur Press the a or v key to cl at high speed.	Bracket) sec after er	Itering into se	tting mode,
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RUN r CV S RUN r CV S CV S	A-out Min. 91 A-out Min. 91 A-out	g.) Changing SV from 0.0 to the fit there is no additional key t will be automatically retur Press the ▲ or ♥ key to cl at high speed. Flashes ault) sec after er usly, number	etering into se is increased/	tting mode, //decreased
el cut iv S RUN r iv S acti Settin neter 5	interest of the second	g.) Changing SV from 0.0 to ff there is no additional key t will be automatically retur Press the 🛆 or 🔍 key to cl at high speed.) sec after er usly, number	entering into se is increased/	tting mode, /decreased
el cut	out Min. 91out Min. 91out Setting mode Eout Cory Default Default Default U U	g.) Changing SV from 0.0 t f there is no additional key t will be automatically return Press the a or ▼ key to cl at high speed. Flashes MD ault Parameter Default t ob t Su upp) sec after er usly, number	errameter <u>Γ L E</u>	tting mode, /decreased
el cut	A V A V A V A V A V A V A V A V	g.) Changing SV from 0.0 to ff there is no additional key t will be automatically retur Press the â or ♥ key to cl at high speed. Flashes ault Parameter Default 1 nb 0.0 USU TO		e group efault 1 220 220	attering into se is increased/	tting mode, /decreased
el cut el cut iV S RUN r i C Settin neter 5u ameter 95 i neter 95 i neter	A-out Min. 91 A-out Min. 91 A-out	g.) Changing SV from 0.0 to the fithere is no additional key t will be automatically retur Press the ▲ or ♥ key to cl at high speed. Flashes MD Parameter Default i nb ΩΩ L Su 400 HSu 9 99		Sec after er usly, number Sec after er Sec after	Derrameter <u>CLE</u> <u>dUL</u> <u>UnE</u>	tting mode, //decreased



ON ratio (50%)

Compressor ON output OFF

output has 10 min cycle and turns ON for 5 min and

turns OFF for 5 min.

3. Defrost Control

then operating a compressor for a long time, an evaporator and a freezer are freezing and thermal efficiency compressor is decreased. For increasing thermal efficiency, defrost operation helps to remove frost or ice ound of evaporator.

around of evaporation. Set defrost cycle, time, etc. to operate defrost (heater defrost). The front defrost (DEF) output indicator turns ON during defrost output and it flashes during defrost delay

operation. •Defrost cycle [dl n], Defrost time [dE E] Set defrost cycle and time to operate defrost at every set cycle and during the set time. Set defrost cycle as [0], only manual defrost is available. Setting range of defrost cycle: 0 to 24 hour Defrost time Setting range: 0 to 59 min •Manual defrost Execute defrost manually regardless of the set defrost cycle. Hold the ▲ key for 3 sec to operate defrost during the set defrost time. When defrost output turns ON, operating compressor output, Evaporator-fan output turn OFF. Hold the ▲ key for 3 sec during manual defrost, applied manual defrost is complete and pre-set defrost set defrost time. cycle restarts

cycle restarts. **Defrost end delay and Evaporator-fan start-up delay time** [d+P] Defrost end delay time and Evaporator-fan start-up delay time operate individually bye one setting. Setting range: 0 min 00 sec to 5 min 59 sec Defrost end delay time: During defrost operation, drops may exist at evaporator. Set the time to drain remained drops after completing defrost. • Evaporator-fan start-up delay time: If evaporator temperature is increased by defrost operation, warm air may flow into cooling system by Evaporator-fan operation. Set Evaporator-fan start-up delay time to prevent warm air inflow, and it may increase cooling efficiency.

Evapoi	rator-fan operat	ion mode					
mpressor	Start-up Compressor	Defroster operation period Defroster operation	Compressor operation	Defroster operation period Defroster operation	Compressor operation		
	Defrost cycle	Defrost time time	Defrost cycle	Defrost time time	Defrost cycle	Defrost time	
Defrost							
EF I					un ereter fan deleu	L	
EF2	Evaporator-tan dela	y Eva		E	vaporator-ran delay		
EF3		1 -		i – İ	;	İ	
ЕFЧ							
EFS							
Por	wer ON	NI 1000 440					
evap	orator-fan).	IN DUI INE dedicati	ed indicator fla	snes at the delay	period (compres	sor, derros	ι,
rameter	Operation metho	d					
EF I	When compresso evaporator-fan al	or operates, evapo so operation turns	orator-fan also s OFF.	operates. When o	compressor oper	ation is finis	shed,
EF2	When compresso time. When comp defroster operation	or operates, evapo pressor operation on)	orator-fan oper is finished, eva	ates after the set aporator-fan opera	evaporator-fan s ation turns OFF. (tart-up dela regardless	of
EFЭ	When power turn (regardless of con	s ON, evaporator mpressor operation	-fan operates. on)	When defroster o	perates, evapora	itor-fan stoj	ps.
EFЧ	Evaporator-fan o compressor and	perates only wher defroster stops. (f	n operating cor or above zero	npressor or defro temperature conti	st. Evaporator-fa rol)	n stops wh	en
EFS	Evaporator-fan o	perates from pow	er ON to powe	r OFF. (regardless	of compressor, o	lefroster	

operation)

5. Loop Break Alarm (LBA) [LbR]

When freezer temperature is not changed over 1.0 (2°F) during set LBA monitoring time [L bA] of parameter 1 group, it regards as abnormal compressor and it displays error. ($E_{\Gamma \Gamma} \leftrightarrow L_{D}R$, flashings in turn) When error occur, compressor is controlled according to the set compressor operation cycle [$E \downarrow E$] and duty ratio [$d \downarrow E$] when error occur. Check the compressor and hold the ▲+▼ keys for 3 sec and error clears and it operates

-

Setting range: 0 to 999 sec (Setting as []], LBA function does not operate)

eventing changing SV and parameters of		Display	Description
		oFF	Unlock
paramete	. g.oup.	L E. I	Parameter 2 group
		L C.2	Locks parameter 1, 2 groups
ror Disp	lay	L [.3	Locks parameter 1, 2 groups, SV setting
ing in turn	Description		Troubleshooting
→o₽n	When input sensor is break or sensor is disconnected.		Check input sensor status.
→ННН	If the measured temperature is higher than high- limit temperature among temperature setting range.		It clears when input is within the display
→LLL	If the measured temperature is lower than temperature among temperature setting ra	range.	
→L ЬЯ	Even though input sensor is normal, freezer temperature does not change over 1.0°C (2°F) during LBA monitoring time (LbA)		Check the compressor and hold the \blacktriangle + \bigtriangledown key at the same time for 3 sec. It clears when input is within the adequate range.

Cautions during Use

Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
 Check the polarity of the terminals before wiring the temperature sensor.

For RTD temperature sensor, wire it as 3-wire type, using cables in same thickness and length. For RTD temperature sensor, wire it as 3-wire type, using cables in same thickness and length. For thermocouple (CT) temperature sensor, use the designated compensation wire for extending wire. 3. Keep away from high voltage lines or power lines to prevent inductive noise.

In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line. Do not use near the equipment which generates strong magnetic force or high frequency noise

. Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power

Do not use the unit for other purpose (e.g. voltmeter, ammeter), but temperature controller.
 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
 Make a required space around the unit for radiation of heat.

②Altitude max. 2,000m

④Installation category II

For accurate temperature measurement, warm up the unit over 20 min after turning on the power Install a surge absorber at each end of inductive load coil when controlling high-capacity power relay or inductive load (e.g. magnet).

Make sure that power supply voltage reaches to the rated voltage within 2 sec after supplying power.

10. Do not wire to terminals which are not used.

 This unit may be used in the following environments.
 Olndoors (in the environment condition rated in 'Specifications') ③Pollution degree 2

Major Products

otoelectric Sensors er Optic Sensors or Sensors or Side Sensors a Sensors ximity Sensors ssure Sensors ary Encoders or State Sensors	Temperature Controllers Temperature/Humidity Transducers SSRs/Power Controllers Counters Timers Panel Meters Tachometer/Pulse (Rate) Meters Display Units	Autonics Corporation http://www.autonics.com
Inector/sockets Sensor Controllers throl Switches/Lamps/Buzzers Terminal Blocks & Cables per Motors/Drivers/Motion Controllers phic/Logic Panels d Network Devices		■ HEADQUARTERS: 18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, South Korea, 48002 TEL: 82-51-519-3232 ■ E-mail: sales@autonics.com
er Marking System (Fi er Welding/Cutting Sy	ber, Co ₂ , Nd: YAG) stem	DRW160896AC