		C3YF S		
I_N		RUCTIO		
		C3YF	alites	
			MD	
Т	hank vo	ou for choosing ou	r Auto	nics product.
		Ũ		derations before use.
Safety Conside			er prod	uct operation to avoid hazards.
Safety considerations a	are categori	ized as follows.		·
		nstructions may result in structions may result in pe		s injury or death. injury or product damage.
A .	-	and instruction manual in the to special circumstance		nt the following hich hazards may occur.
▲ Warning				
Fail-safe device must	be installe	ed when using the unit	with m	nachinery that may cause serious inju edical equipment, ships, vehicles,
railways, aircraft, com Failure to follow this ins	bustion a struction ma	pparatus, safety equip ay result in fire, personal	ment, o	crime/disaster prevention devices, etc
	struction ma	ay result in electric shock		
Failure to follow this ins Check 'Connections'	struction ma	ay result in electric shoc ing.		
Failure to follow this ins Do not disassemble of Failure to follow this ins	or modify t	ay result in fire. he unit. ay result in electric shocl	k or fire	
▲ Caution				
screw with a tightenin	ng torque o	of 0.3~0.4N·m.		28~12 cable and tighten the terminal
28~16 cable and tight	en the terr	put and communicatio ninal screw with a tigh ay result in fire or malfur	tening	without dedicated cable, use AWG torque of 0.3~0.4N·m. ue to contact failure.
Use the unit within the				
	struction ma	ay result in fire or produc		
Use dry cloth to clean Failure to follow this inst	struction main the unit, a struction main	ay result in fire or produce and do not use water of ay result in electric shock	r organ	nic solvent.
Use dry cloth to clean Failure to follow this ins Do not use the unit in radiant heat, vibration	struction main the unit, a struction main the place n, impact, o	ay result in fire or produc and do not use water of ay result in electric shock where flammable/expl or salinity may be pres	or organ k or fire osive/c ent.	nic solvent.
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Nodel Power supply		ons								
supply		TC3YF-1 R	TC3YF-2_R	1	TC3YF-3_R		Parame 1. Parameter 1 g	roup		e MD key after
	AC power	100-240VAC~ 50/60Hz					► RUN mode	-		MD key for 3 s
Allowabl	DC power e voltage range	12-24VDC== 90 to 110% of rated voltage					MD MD 3	sec	A 1010 UIE	
Power	AC power	Max. 4VA (100-240VAC 50					3 sec			
	otion DC power	Max. 8W (12-24VDC)	00112)				 → [H	A , V	· I.O	Setting ran
Display r	method	7 Segment LED method (re	ed)				↓ MD			
	er size (W×H)	7.4×15.0mm					Defrost cycle			Setting ran
nput typ		NTC: 5kΩ, RTD ^{×1} : DPt 100							- 4	Setting a
	e resistance	Allowable line resistance is 500ms	max. 5Ω per a v	vire			↓ MD			
Sampling		• At room temp. (23 ±5°C):	(PV +0.5% or 1°	c select the h	nigher one) rdg +	1digit	Defrost time	▲, ▼ .		Setting ran
Display a	accuracy	• Out of room temp. range:						,	- 30	
	Compressor (COMP)	$250VAC\sim 5A$ 1a								
Control Dutput	Defrost (DEF)	-	250VAC~ 10A	.1a			LBA monitoring time			0.00
	Evaporator-fan (FAN)	<u> </u>	<u> </u>	2	250VAC \sim 5A 1a		LLAR-	A , V	0	Setting rang Setting a
Control r		ON/OFF control					MD			X oottang a
lysteres		0.5 to 5.0°C, 2 to 50°F varia Mechanical: Min. 20,000,00		ectrical: Min	50 000 operation	ne	Input correctio	n 		
	Compressor (COMP)	(250VAC 5A resistive load)		couridal. Iviiri.	50,000 operation	13	Inb-	A , V	0.0	Setting ran
Relay	Defrost (DEF)	Mechanical: Min. 20,000,00		ectrical: Min.	100,000 operation	ons	↓ MD			
ycle		(250VAC 10A resistive load	,	ostriasl: Min	EQ 000 eneration		SV low-limit	A , V		
	Evaporator-fan (FAN)	Mechanical: Min. 20,000,00 (250VAC 5A resistive load)		ecurcal. Will.	50,000 operation	15			- 40.0]
/lemory	retention	Approx. 10 years (non-vola	tile memory met	hod)						
	n resistance	100MΩ (at 500VDC megge	1				SV high-limit	A , V	9 9.9	Setting ran
Dielectrio	c strength	2000VAC 60Hz for 1 min (b							د. ب	
/ibration	Mechanical Malfunction	0.75mm amplitude at frequence		-			2. Parameter 2 g	roup	WD C	
lais -	AC power	0.5mm amplitude at frequence Square-wave noise by the no					RUN mode	•		e MD key after oves to the ne:
voise esistanc	· ·	Square-wave noise by the no					MD MD 5	sec	%Hold the	MD key for 3 s
	Ambient				pridac di	pridou	3 sec ▼			e dot line parar
Environn	temperature	-10 to 50°C, storage: -20 to	000				Compressor star delay and	-up		
	Ambient humidity	35 to 85%RH, storage: 35	to 85%RH				restart delay tin	^{ie} ▲, ▼ 、	<u> </u>	
Protectio	numiaity on structure	IP65 (front part, IEC Stand					<mark> 5</mark> dL -	- Č	0.2.0	Setting rang
	AC power	R (except RTD option				——	MD			
Approva	DC power		/				Compressor min. operation tim	۵		
Veight*		Approx. 229g(Approx. 143g	3)				ont	e 	0.20	Setting ran
	input type is opti						MD		0.00	0
	weight includes p el specification ar	ackaging. The weight in pare id option.	entheses is for ur	nit only. The w	eight may be va	aried by	Defrost end delay	and		
		is rated at no freezing or cor	densation.				Evaporator-fan			
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Parameter Group When operating a compressor for a long time, an evaporator and a freezer are freezing and thermal efficiency, of compressor is decreased. For increasing thermal efficiency, defrost operation helps to remove frost or ice around of evaporator. 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 coercitions. $\times \mathsf{Press}$ the MD key after checking/changing each parameter to save the SV eter 1 group and it moves to the next parameter Imode *Hold the MD key for 3 sec while in setting mode to return RUN mode. MD 3 sec operation. •Defrost cycle [d! 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 cycle restarts operation teresis 195 MD 1.0 Setting range: 0.5 to 5.0°C, 2 to 50°F ost cycle **A**, **V** Setting range: 0 to 24 hour Ч 11 n |-Setting as []], only manual defrost is available. MD 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. ost time ▲, ▼ → 30 Setting range: 0 to 59 min %Setting as [7], defrost output does not operate. IEE MD Setting range: 0 to 999 sec %Setting as [2], LBA function does not operate. ۵ MD 4. Eva orrection Setting range: -10.0 to 10.0°C, -18 to 18°F ~b w-limit Comp ▲, ▼ → - 40.0 MD De Setting range: Refer to 🔳 Input Type and Temperature Range gh-limit ▲, ▼ ▶ 9 9.9 15... eter 2 group $\ensuremath{\mathbb{X}}\xspace$ Press the $\ensuremath{\mathbb{MD}}\xspace$ key after checking/changing each parameter to save the SV mode and it moves to the next parameter. %Hold the MD key for 3 sec while in setting mode to return RUN mode. MD 5 sec The dot line parameter may not be displayed by other parameter setting. ssor start-up lav and t delay time ▲, ▼ ↓ 0.20 Setting range: 0 min 10 sec to 9 min 59 sec × . pressor eration time Paran E Setting range: 0 min 10 sec to 5 min 00 sec MD end delay and E orator-fan lay time ▲, ▼ ▶ 1.00 Setting range: 0 min 00 sec to 5 min 59 sec Ε MD orator-fan E tion mode 5.1.00 When 1 grou MD operation cycle occur when error occur. Check the compressor and hold the [] + [] keys for 3 sec and error clears and it operatesrror occurs Setting range: 0 to 20 min Setting range: 0 to 999 sec (Setting as []], LBA function does not operate) 6. Lock sor duty ratio For pre each p TOT OCCUTS Setting range: 0 to 100% Setting range: U to 100% \$0 XNot appear when compressor operation cycle when error occurs IUE I [[LE] is set as []]. MD 7. Err . ature un οF Flash Int MD Erre ock Erre _L [. | **↓** | L[.2|↓ ٥Ľ L C.3 Erre nctions Frre ressor Protection ressor Protection ion is for preventing compressor from life cycle shortening or malfunction by overload and frequent of compressor. As compressor protection settings, when compressor output does not ON, the front or (COMP) output indicator is flashing. 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. essor start-up delay and restart delay time [5dL] uns ON instantly from break-down or power OFF, it delays start-up during the set time of compressor. t frequent compressor ON/OFF, set compressor ON time after compressor turns OFF. 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. nae: 0 min 10 sec to 9 min 59 sec ssor min. operation time [a^b] t frequent compressor ON/OFF, set min. operation time. Setting range:0 min 10 sec to 5 min 00 sec 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 ※1. When starting compressor, if present value (PV) is out of hysteresis range, compressor output does not turn ON and Comp . Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power t-up delay time 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. delay time operation time the compressor (COMP) output indicator is flashing during compressor start-up A starting using compression start-tup delay time.
 When present value (PV) is out of hysteresis, compressor output does not turn ON and the compressor (COMP) output indicator is flashing during compressor restart delay time.
 If present value (PV) is below the SV, compressor output maintains ON status during compressor min. operation time. After compressor min. operation time, it turns OFF. 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. **X3** Time 11. This unit may be used in the following environments. ()Indoors (in the environment condition rated in 'Specifications') ()Pollution degree 2 **★**3 ②Altitude max. 2,000m ④Installation category II ressor Control When Error Occur Major Products emperature control is impossible due to error, it controls compressor output by the set operation cycle Phi Fib Do Do Do Are Prrc Prrc Ro Co Sw Co Sw Co Ste Gra Fie Las atio to protect control object. Until error is cleared, operation cycle and duty ratio are applied repea tedly ssor operation cycle ICLE1, duty ratio IdUt 1 when error occur essor operation cycle and ON duty ration when error occur

	Set operation cycle as [2], and compressor output turns OFF.
	Set duty ratio as [100], and compressor output turns ON continuously.
1	Setting range of compressor operation cycle when error occur: 0 to 20 min
	Setting range of compressor duty ratio when error occur : 0 to 100%

3. Defrost Control

	and it may morea	se cooling chicien	cy.				
ароі	rator-fan operati						
essor	Start-up Compressor	Defroster operation period Defroster operation	Compressor operation	Defroster operation period Defroster operation	Compressor operation	1	
	■ Defrost cycle	Defrost time Defrost delay	Defrost cycle	Defrost time dela	Defrost	Defrost time	
efrost							
EF I						<u> </u>	
EF2	Evaporator-fan delay	r Evap	orator-fan delay		Evaporator-fan delay	1	
E F B							
ЕFЧ							
EFS				•			
Outp	wer ON ut does not turn Of orator-fan).	N but the dedicate	d indicator fla	shes at the del	ay period (compres	sor, defrost,	
neter	Operation method	i					
FI	When compresso evaporator-fan als			operates. Whe	n compressor oper	ation is finishe	d,
F 2		ressor operation is			et evaporator-fan s eration turns OFF.		
F∃		s ON, evaporator- npressor operation		When defroste	r operates, evapora	tor-fan stops.	
FЧ		erates only when lefroster stops. (fo			frost. Evaporator-fa introl)	n stops when	
F 5	Evaporator-fan op operation)	perates from powe	r ON to powe	r OFF. (regardle	ess of compressor, o	lefroster	
free p, it	regards as abnorr	not changed ove nal compressor a	nd it displays	error. (Err↔L	onitoring time [L bA bA, flashings in tur cycle [C L E]and du	n) When error	

DCK		Display	Description	
	changing SV and parameters of	oFF	Unlock	
parameter group.		L [. I	Parameter 2 group	
			Locks parameter 1, 2 groups	
rror Disp	lav	L C.3	Locks parameter 1, 2 groups, SV setting	
hing in turn	Description		Troubleshooting	
⇔o₽n	Pn When input sensor is break or sensor is disc		Check input sensor status.	
HHH If the measured temperature is higher that limit temperature among temperature setti			It clears when input is within the display	
⇔LLL	If the measured temperature is lower than temperature among temperature setting ra		range.	
⇔∟ьЯ	Even though input sensor is normal, freez temperature does not change over 1.0°C during LBA monitoring time [LBR].		Check the compressor and hold the \blacktriangle + ∇ key at the same time for 3 sec. It clears when input is within the adequate range.	

Operation cycle ON ratio (50%)

Compressor ON output OFF

otoelectric Sensors er Optic Sensors or Side Sensors a Sensors iximity Sensors issure Sensors tary Encoders nnector/Sockets	Temperature Controllers Temperature/Humidity Transducers SSRs/Power Controllers Counters Counters Timers Panel Meters Tachometer/Pulse (Rate) Meters Display Units	Autonics Corporation
itching Mode Power ntrol Switches/Lamp Terminal Blocks & C pper Motors/Drivers aphic/Logic Panels Id Network Devices	s/Buzzers cables	HEADQUARTERS: 18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, South Korea, 48002 TEL: 82-51-519-3232 E-mail: sales@autonics.com
ser Welding/Cutting		DRW160896AB