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Spec F3 Seri	cificatio	ons					Connections • TF31-1 G
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lay meth	nod	7 Segment LED me		,	,		
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lay accu Com						emp. range: ±2°C±1 digit A, 1c/250VAC~20A 1a	SENSOR DIGITAL INPUT • TF33-
Defr	ost (DEF)	250VAC~ 10A, 24	VDC 10A	A, 1a	.,		
Auxi	liary (AUX)	250VAC~ 5A, 30V	DC 5A, 1		2C 405 comm	unication output	COMP 0 250VAC 5 30VDC 5/
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	⁾ 20A 1a ost (DEF)					perations (250VAC 20A)	SENSOR /RS485 [®] DIGITAL INPUT
	liary (AUX)					perations (250VAC 10A) rations (250VAC 5A)	DIGITAL INFOT
ory rete		Approx. 10 years (r				(%1: Only for compressor+defro
	sistance	Min. 100MΩ (at 50			single and set		defrost+auxiliary (alarm/ev %2: Only for compressor+defro
	AC power AC/DC power					se, power and input circuit) se, power and input circuit)	 3: Only for synchronize defrost
e resista		Square-wave noise	by the noise	simulator (pul	se width: 1µs)	±2kV R-phase and S-phase	
ation	Ambient				r 1 min) in eac	h X, Y, Z direction for 2 hours	Dimensions
	Ambient temp. Ambient humi.						O TF3 Series
essories		Bracket: 2, NTC se					<u>71</u>
ection st	ructure	IP65 (front case)					
oval tht ^{%1}		Approx. 207g (appr	ox 105a)				
<u></u>	displav ur	it [TFD, sold sep					
el	TFD-3	TFD-5	Vibratio		1.5mm amplitu	de at frequency of 10 to 55Hz	
er suppl						ach X, Y, Z direction for 2 hours	
	ption Max. 1W	/ ent LED method (red				storage: -20 to 60°C I, storage: 35 to 85%RH	 NTC sensor (5kΩ)
		TL Level), Half duple		ion structure		i, otorago: oo to oo in tir	ω
m. cycle			Approv		CE 🛙		x x
e Tho woir	Ø2.5mm					(approx. 48g) ht is varied by model option.	Σ
		is rated at no freezin			only. The weig	Incis varied by model option.	
Dart	Docori	ntion					
Part	Descri	puon					
						component (red):	Max. 15
	2 1	8 9		RUN mode: Di Settina mode:		nt value (PV). ameter and setting value.	4 2000
TF3			2. [Deviation ind	icator (: gre	een, ▼/▲:red):	○ TFD (sold separately)
- 66712 - 5555				setting value (t value (PV) based on	
- BAN			F	PV deviation	Deviation	dieplay	
Autonio				emperature			
				/lore than 1.8° Vithin ±1.8℃	indicato		
∩—		7 11 10		ess than -1.8			<u>_</u>
	╘╴┉		3. (Compressor	(COMP) outp	ut indicator (green):	
	1b					utput. In case of ation and output does not	
		₩ @	t	urn ON, it flas	hes.	-	
				or 2 sec, and		r continuously, it turns ON 1 sec.	
freet /P		12 ndicator (green):					
rns ON 1	for defrost ou	tput. Flashes for defr					Remote Displ
rns ON i	for 2 sec and or-fan (FAN)	OFF for 1 sec for ma output indicator (gr	nual defros	t or Power Of	V defrost.		G
rns ON t	for evaporato	r-fan output. Flashes		peration of ev	aporator-fan o	output.	300
rns ON t	(AUX) output for alarm outp	t indicator (green): out. Flashes for delay	operation of	of alarm outpu	ıt.		 """
		isplays temperature				rameter 1 group. ing parameter or saving SV.	
(AUX) I	key : Used fo	r entering SV setting	group or ch	nanging setting	g value.	ing parameter or saving ov.	5.0 m 20 m 21
old the I	key over 3 se kev: Used fo	c to select active/inac or entering SV setting	tive auxilia aroup or cl	ry output in R hanging settin	UN mode. a value.		
old the l	key over 3 se	c to execute/stop ma	nual defros	t in RUN mod	e.	na diaita	When connecting TFD to the
		for entering SV setting to active/inactive co				ng aigns.	converter, sold separately) for SCM-38I(RS232C to RS485
		curs, press the key o uxiliary (alarm/evapo					
uzzer [b	UE] of param	eter 1 group is set as	;[on]) ´				SV Settings
is for dis		data at remote displa					You can set the temperature to
		CM-US (USB/Serial of ameter setting by PC		old separately), it is a PC lo	ader port of serial	Set range is within SV low-limi
		÷ ;		Dong	<u> </u>		E.g.) In case of changing SV f
-	riyhe	and Tempe				I=	() TF3
t type	-	Decimal point Dis			re range (°C)	Temperature range (°F)	
		1 "	5.H	-40 to 99		-40 to 212	
	NTC 5kΩ	0.1	5.6	-40 to -20		-40 to -20 -19.9 to 99.9	Autonics
mistor		'		-19.9 to 99	1.9	100 to 212	Dreep on the order
C)		1 ,	n LH	-40 to 99		-40 to 212	Press any key among (mode to enter into SV set
	NTC 10kΩ	0.1		-40 to -20		-40 to -20 -19.9 to 99.9	Last digit (10° digit) on SV
		0.1	n UL	-19.9 to 99	.9	100 to 212	3
		1 .	IP,H	-99 to 99		-148 to 212	
×1	DPt 100Ω	0.1	IP.L	-99 to -20	• •*?	-148 to 212	
3 Coria	displays or h			-19.9 to 99			
		y 3 digits. If PV decin					Autonics

ement program (DAQMaster) by communicating via PC.

for 1CH input model (TF31-

If PV with "-" sign is over 3 digits (e.g.: -99.9), the numbers below decimal point does not display. You can check it at the comprehensive device management program (DAQMaster) by communicating via PC.

COMP OUT 250VAC 20A RESISTIVE LOAD 1234 56789101112 NTC 5K/10K HOH. ▲ =_+= SOURCE 100-240VAC 50/60Hz, 24VAC 50/60Hz, ------DPt100 ĮĮ SENSOR DIGITAL INPUT 12-24VDC • TF33- H-DEF OUT 250VAC 10A 24VDC 10A RESISTIVE LOAD×1 AUX OUT 250VAC 5A 30VDC 5A RESISTIVE DEF OUT 250VAC 10A 24VDC 10A RESISTIVE LOAD^{×1} COMP OUT 250VAC 16/ 24VDC 16A RESISTIVE /IP OUT /AC 5A DC 5A COM S1 S2 S3 COM 1 2 3 4 6789101112 <u>∧</u> ¦⊙¦ Ş ş L_,_± SOURCE 100-240VAC 50/60Hz, VCHRONIZE NTC 5K/10K SENSOR 24VAC 50/60Hz, DIGITAL INPUT 12-24VDC defrost or auxiliary (alarm/evaporator-fan) output model (TF3_-2_ ---), compressor+ m/evaporator-fan) output model(TF3_3_____). defrost+auxiliary (alarm/evaporator-fan) output model (TF3_-3____). efrost function model (TF33-___A-S), or RS485 communication model (TF33-___A-T/A). (unit: mm) 5.5 74.3 77 Þ Bracket AWG22 TPE lead wire Soldering 5±1 12 23.9 2000±50 ely) Panel cut-out 3 12 (unit: mm) Series Size A TF3 D Ø2.5 3m or 5m Min. 100 *1 Min. 55 70.3* 28.2** TFD Min. 65 Min. 40 45.7^{+0.6} 25.4^{+0.3} ※1. When connecting remote display unit (TFD), or SCM-US, Min. 120 play Unit (TFD) [sold separately] Remote display unit (TFD) displays current temperature or output status of TF3 at remote place. TFD cable is TFD-3: 3m, TFD-5: 5m. Connect the phone-jack of remote display unit (TFD) to the data loader communicate with upper devices (PC, PLC, etc.) If TFD communication with TF3 error occurs, TFD flashes display component for 1 sec. Check the connection with TF3. to the data loader port of TF3, you cannot connect Autonics SCM-US (USB to Serial ely) for communication. Use SCM-US48I(USB to RS485 converter, sold separately), S485 converter, sold separately). ire to control with 🔇, 💓, 🙈 keys. -limit value [Ł 5u] to SV high SV from 19°C to 10°C mit value [H5]

• TF31- 🗆 🗛

250VAC 5A 30VDC 5A

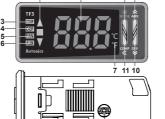




 $(10^{\circ} \rightarrow 10^{1} \rightarrow 10^{2} \rightarrow 10^{3} \rightarrow 10^{\circ})$



If there is no additional key operations in 3 sec the changed SV is automatically saved.



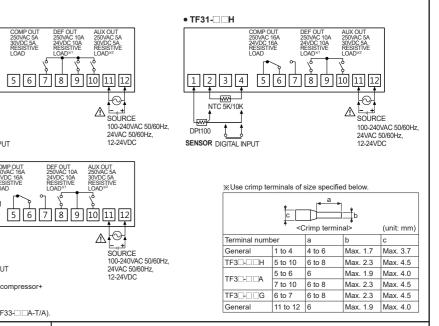




n SV display part flashe



Press 🛛 , \land key to raise or lower the set value. $(9 \rightarrow 0)$



Comprehensive Device Management Program [DAQMaster]

DAQMaster is comprehensive device management program. It is available for parameter setting, monitoring , and user parameter group setting, parameter mask setting for only TF3 Series. DAQMaster can be downloaded from our web site at www.autonics.com.

Item	Minimum specifications
System	IBM PC compatible computer with Pentium III or above
Operations	Windows 98/NT/XP/Vista/7/8/10
Memory	256MB+
Hard disk	1GB+ of available hard disk space
VGA	Resolution: 1024×768 or higher
Others	RS232C serial port (9-pin), USB port

Parameter Mask

This function is able to hide unnecessary parameters to user environment or less frequently used parameters in parameter group. You can set this in the comprehensive device management program (DAQmaster) Masked parameters are only not displayed. The setting value of masked parameters are applied.

For more information, refer to DAQMaster user manual Visit our web site (www.autonics.com) to download DAQmaster program and the user manual.

Before applying mask PR 1 + 1 nt + 52 + 53 + utr + Unt ...

After applying mask The above is masking input sensor 3 selection [53], temperature unit [Unt] of parameter 1 group for 3CH input model (TE33-

■ Parameter User Group [PRU]

This function is able to set the frequently used parameters to the user parameter group. You can quickly and easily set parameter settings. User parameter group can have up to 30 parameters in the comprehensive device management program (DAQMaster). For more information, refer to the DAQMaster user manual.

Visit our web site (www.autonics.com) to download the DAQMaster program and the user manual.

RUN mode

PRU PR I ···· PR5

•

 d_{5L} H_{45} d_{EF} d_{EE} $R_{H_{3}}$

 The above is setting user parameter group in the DAQMaster with delay display period [d_{5L}] of parameter 1 group, hysteresis [H_{45}], night mode hysteresis [H_{43}] of parameter 2 group, defrost method [d_{EF}], defrost time [d_{EE}] of parameter 3 group, alarm output hysteresis [H_{43}] of parameter 4 group.

Virtual Temperature Rate [utr]

(only for 3CH input model: TF33n case of 3CH input model (TF33-......), input sensor 3 selection [53] of parameter 1 group is set as outlet

emperature [£5]. You can set virtual temperature rate. ture of inlet and outlet is significantly different at freezer, virtual temperature helps to control If the tempera temperature efficiently.

Virtual temperature is designated by the rate of input sensor 1 (inlet temperature) and input sensor 3 (outlet temperature). There is virtual temperature calculation formula.

[{100-virtual temperature rate} × input sensor 1 temperature]

100

If virtual temperature rate [uEr] is set as [0], virtual temperature (PV)= input sensor 1.

If virtual temperature rate [u E.r] is set as [100], virtual temperature (PV)= input sensor 3

E.g.) If inlet temperature of input sensor 1 is 0°C, and outlet temperature of input sensor 3 is 10°C, set virtual temperature rate [u E.r.] as [50] and virtual temperature is 5°C to control temperature.

- 5=___[{100-50}×0]+ [50×10]
- 100

Setting range of virtual temperature rate: 0 to 100 (%)

Display Selection [dP.L]

(only for 3CH input model: TF33-

You can select input sensor to display at present value (PV) display component in RUN mode

Parameter	Description
51	Displays PV of input sensor 1 (inlet temperature).
52	Displays PV of input sensor 2 (defrost temperature).
53	Displays PV of input sensor 3 (outlet temperature).
u 5	Displays virtual temperature.

Press any key among O 2 sec				© 3 sec
P5 №1 P5 №1 When PW is valid When PW is valid When PW is valid				
SV setting Display selection Parameter user group	Parameter 2 group			Parameter 5 group
[5u] [dPL] [PRU]※2 [PR I] Saved automatically after 3 sec [O [O	<u>[₽₽2]</u> ©			
Monitoring time [īa⊥] User parameter 0 [Input type [i a⊥]	Comp. output mode [oF L]	Defrost method & operation [dEF]	Alarm operation mode [RL]	Current hour [CUH]
©1.5 sec © 1.5 sec © 1.5 sec ©	_ ◎ 1.5 sec ◎	© 1.5 sec	© 1.5 sec ⊚	© 1.5 sec ⊚
Max. value [HPL]	Hysteresis [H15]	Defrost cycle [d/ n]	Alarm option [AL.E.]	Current minute [[Un]
Min. value [LP L'] User parameter 1 to 29 Input sensor 3 selection [53]	Offset [o F 5]	Real-time defrost cycle [r.d1]	Alarm high-limit deviation [RLH]	Digital input [d1]
Virtual temperature rate [ut.r]	SV high-limit [H5 J]	Real-time defrost cycle 1: hour [dH 1]	Alarm low-limit deviation [RLL]	Loop break alarm monitoring time [L b R]
Temperature unit [Un E]	SV low-limit [L 5]	Real-time defrost cycle 1:	Alarm hysteresis [RHY]	Comm. address [Adr]
Input correction 1 [! b. l]	Night mode [nād]	[min [dň /]	Alarm ON delay time [Ron]	Comm. speed [bP5]
Input correction 3 [! b.3]	Night mode hysteresis [n.H ±]	: Real-time defrost cycle 8:	External alarm delay time [ERd]	Comm. parity bit [Pr E]
Delay display period [d5£]	Night mode offset [n.o.F.]	hour [dH8]	Alarm output method [Rn]	Comm. stop bit [5EP]
Defrost/auxiliary output [5dR]	Night mode start hour [n.5H]	Real-time defrost cycle 8: min [dñ8]	Evaporator-fan operation [F.E.Y]	Comm. response wait time [r
Auxiliary output [RUh]	Night mode start min [n.5 n]	Defrost time [dE E]	Evaporator-fan control temperature [F.Ł]	User level [U5 r]
Buzzer [b U E]	Night mode end hour $[\alpha E H]$ Night mode end min $[\alpha E \bar{\alpha}]$	Pump down delay time [Pdd]	Evaporator-fan hysteresis [F,H,Y]	SV setting group lock [L.
1. [P5] parameter appears only when password is set. The default password is [DDD]. If password is not valid, the	Temperature monitoring [E.o.]	Defrost end delay time [dr.b]	Evaporator-fan mode [FRn]	Front key lock [Ld 2]
password code appears. Press any key among the ⓓ, ◙, । keys to return to password entering window. Press the ⊚	Comp. start-up delay time [5 dL]	Defrost hysteresis [dHY]	Evaporator-fan start-up delay time [P.d.r.]	PA 0 group lock [L.P.0] PA user group lock [L.P.U
(MODE) key to return to RUN mode. If you forget password, contact Autonics after checking	Comp. min. operation cycle [[y[]	Defrost when power ON [P,dE]	0	PA user group lock [LP]
password code. 2. It appears when setting user parameter group in the comprehensive device management program (DAQMaster).	Comp. restart delay time [r dL] Comp. min. operation time [onb]	Defrost delay when power ON/ manual defrost [dd E]		PA 2 group lock [L.P.2.]
Press the ((MODE) key after changing the setting to save the SV.	Comp. continuous operation [[[]]	Defrost group [d&r]		PA 3 group lock [L.P.3]
Hold the ⊚ (MODE) key for 1.5 sec while in setting mode to move to the parameter group.	Alarm delay time after	Parameter copy [P.d.C.]		PA 4 group lock [L.P.4]
Hold the () (MODE) key for 3 sec while in setting mode to return RUN mode.	Comp. operation cycle when	Prior defrost selection [d.P.r.]		PA 5 group lock [L.P.5] Password [Pud]
Press the (MODE) key at the last parameter of each parameter group, it moves to that parameter group name. You	sensor break [[LE]	Defrost time unit [U.d.E.] Alarm delay after defrost/		0
can move to other groups with ⊠, ⊠ keys. ≾If there is no additional key operation within 30 sec after entering	Comp. duty rate when sensor break [due]	door open [Add]		
into setting mode, it will be automatically returned to RUN mode and previous setting value will be remained.	<u>o</u>	Temperature display during defrosting [Ł.d.E.]		
(The shaded parameters are displayed when user level [U5r] of parameter 5 group is set as standard level [5Ld].	© 3 sec	© 0 3 sec	© 3 sec	© 3 sec
I/OFF of compressor. As compressor protection settings, when compressor output does not ON, the front mpressor (COMP) output indicator (green) is flashing. Compressor start-up delay time [5dL] ower turns ON instantly from break-down or power OFF, it delays start-up during the set time of compressor and a contract of the set time of compressor.	around of evaporator. Set defrost cycle, time The front defrost (DE	e, and end temperature, etc t	al efficiency, defrost operation o operate defrost (heater/hot- rns ON during defrost output a	gas defrost).
tting range: 0 to 60 (min) Compressor restart delay time [r dL] prevent frequent compressor ON/OFF, set compressor ON time after compressor turns OFF.	In case of compresso operation is available	when defrost/auxiliary output	evaporator-fan) output model t [5.d //] of parameter 1 group	
tting range: 0 to 60 (min) Compressor min. operation time [თიხ], Compressor min. operation cycle [[ყე]		rost method [dEF]	eration	
prevent frequent compressor ON/OFF, set min. operation time and min. operation cycle. tting range of compressor min. operation time: 0 to 60 (min).		ter defrost gas defrost	during the set defrost cycle/tir	ne
ting range of compressor min. operation cycle: 0 to 60 (min)		ter defrost Operates	when PV is lower than defrost	
Temp. I min. operation cycle i min. operation cycle i min. operation cycle		5	cle/time (only for 3CH input m	odel (TF33-□□-□))
start-up X2 delay time Compressor Compressor Compressor	Set defrost cycle and		ery set cycle and during the s	et time.
restart restart restart time time	Defrost time setting ra	range: 0 to 24 (hour)/0 to 100 ange: 1 to 100 (min/sec)		
	output turns OFF, a	and in case of hot-gas defrost	y defrost method. In case of h , compressor output turns ON	
SV+	%In case of RTC fun		, defrost operates at every sp	
np. ON		• • • •	real-time defrost times are av teresis [dਸਤ] (only for 3CH	
put OFF	Set defrost end temp	erature and defrost hysteresi	s from input sensor 2 (defrost as the set defrost end tempera	temperature). When the
. When starting compressor, if present value (PV) is out of hysteresis range, compressor output does not turn ON and the compressor (COMP) output indicator is flashing during compressor start-up delay tin	e. stopped. It is availabl	e when input sensor 2 ON/O	FF [52] is set as [on] and defi	
2. When compressor delay is completed and it is within compressor min. operation cycle, compressor output does not turn ON and the compressor (COMP) output indicator is flashing. (The latest one has priority between earlier and the delay in the complete and the compression of the complete and the complete and the compression of the complete and the complete	Defrost end temperat	ure setting range: -40 to 99 (tting range: 1 to 5 (1.0 to 5.0)		
between compressor restart delay time and compressor min. operation cycle.) 8. When present value (PV) is out of hysteresis, compressor output does not turn ON and the compression (COLID) control in decision compression of the low lines of th	Manual defrost			
compressor (COMP) output indicator is flashing during compressor restart delay time. I. If present value (PV) is below the SV, compressor output maintains ON status during compressor restriction than the compression control that the there of the status	setting. Hold the front	t 🗑 key over 3 sec or, turn O	rost cycle which consists of d N the digital input when digital	
min. operation time. After compressor min. operation time, it turns OFF. f compressor output does not turn ON due to compressor output condition or parameter settings for	is set as [ñ.d.F.] to ope	rate defrost during the set de		
compressor protection, the compressor (COMP) output indicator is flashing.			nput during manual defrost, a	
Compressor Control When Sensor Break	•Defrost synchron		ize defrost function model	l: TF33-□□A-S,
ormal temperature control is impossible due to sensor break, it controls compressor output by the set operation	M When connecting over		7 A) compressor operation is able	to synchronize via synch
cle and duty ratio to protect control object. Until error is cleared, operation cycle and duty ratio are applied beatedly. When error is cleared, the compressor operates after completing the currently applied operation cycle	terminal/RS485 comr	nunication.	' ' el (TF33-□□A-S), or RS485 c	
d compressor restart delay time. Compressor operation cycle when sensor break [[LLE]	A-T/A). [Setting Order]			(
t compressor operation cycle when sensor break. t as [2] and compressor output turns OFF when sensor break.			S485 communication terminal	ls of the units which are
utting range: 0 to 100 (min) Compressor duty ratio when sensor break [dU≿]	2. Set defrost cycle [I n] same as among the unit	s. (if error occurs, defrost cyc and slave unit(s) (up to 5 units	
et compressor ON duty ratio when sensor break.	According to defrom	st operation of Master, the de	frost operation of slave(s) exe s of slave(s) are also changed	ecutes. (when changing th
.g.) When compressor operation cycle when sensor break [[LE]		r via connected terminals. Th		

■ Alarm (except 1CH, compressor output model: TF31-1□□) Parameter Reset Set both alarm operation and alarm option by combining. Alarm function is available for compressor+defrost or auxiliary (alarm/evaporator-fan) output model (TF3_P2_F_). Also defrost/auxiliary output [5,d#] of parameter 1 group should be set as auxiliary [FiU+], and auxiliary output [FiU+] should be set as alarm [FiL_n]. In case of compressor+defrost+auxiliary (alarm/evaporator-fan) output model (TF3_-3___), auxiliary output Set [1 n]] parameter to [9E5] to reset all parameters. n case pa Password is also rese $[RU_5]$ of parameter 1 group should be set as alarm $[RU_5]$. •Alarm operation [RL] ※ H: alarm output hysteresis [RHY] E Mode Name Alarm operatio Description Flashi off |-No alarm output. H ON ON H OFF If deviation between present value Deviation PV -10°C SV 0°C PV 20°C High-limit deviation [RL,H]: Set as 20, (PV) and setting value (SV) is higher than high-limit or low-limit deviation RLd high, low-Er 🗆 🕷 limit alarm SV, alarm output turns ON. Low-limit deviation [AL.L]: Set as 10 •Alarm option [RLE] E c 🗆 🕷 Mode Name RLR Standard alarm If it is an alarm condition, alarm output is ON. If it is a clear alarm condition, alarm output is OFF. RLb Alarm latch^{×1} If it is an alarm condition, alarm output is ON and maintains ON status. First alarm condition is ignored and from second alarm condition, standard alarm operates. When power is supplied and it is an alarm condition, this first alarm condition is ignored and Standby AL.C sequence 1 from the second alarm condition, standard alarm operates Alarm latch and If it is an alarm condition, it operates both alarm latch and standby sequence. When power is AL.d standby supplied and it is an alarm condition, this first alarm condition is ignored and from the second 2: Eru (virtual temperature) is not applicable. sequence 1 alarm condition, alarm latch operates. F First alarm condition is ignored and from second alarm condition, standard alarm operates Standby RL.E When re-applied standby sequence⁸² and if it is alarm condition, alarm output does not turn ON. After clearing alarm condition, standard alarm operates. sequence 2 • sv Alarm latch and Basic operation is same as alarm latch and standby sequence 1. It operates not only by Parar power ON/OFF, but also alarm set value, or alarm option changing. When re-applied standby sequence³² and if it is alarm condition, alarm output does not turn ON. After clearing alarm condition, alarm latch operates. **RL**F standby sequence 2 • Pa Alter clearing adamt condution, animinator operators. Alter clearing adamt conduction of clearing adamt conduction. Alter clearing adamt conduction operators. Alter clearing adamt conduc Parar υĿ • Par OFF oFF No digital input OFF OFF No digital input RUN/STOP 5 ŁP Pauses compressor output. All output indicators turn OFF. When digital input is OFF, it controls normally after compressor restart delay time. By connecting freezer door switch and digital input contact, it controls compressor/defrost/ Parar ٥F НУ evaporator-fan according the door status. oFS - Digital input ON (door open): Compressor, defrost, evaporator-fan output turns OFF - Digital input OFF (door close): After 1 min, it returns the previous status of door open. Н5υ Door switch - Digital input OFF (door close). Atter 1 min, it returns the previous status or door open. (not applied compressor protection operations) Alarm occurs after the time of alarm delay after defrost/door open [Rdd] of parameter 3 group. When operating compressor continuously, compressor start-up time is extended as long as the door 150 nño open time. • Parameter 3 group [PR3] Night mode ON/OFF Mond When digital input turns ON, night mode is active. Param When digital input turns ON, alarm output turns ON forcibly. (except alarm is ON) When externa External E.R.L dЕ alarm^{*} alarm delay time [EAd] of parameter 4 group is set, alarm turns ON after the set time. Defrost When digital input turns ON and it is defrost operation contion defrost output turns ON d١ EdF When digital input turns ON and it is derives operation contained, terrors output turns OFF. Even though it is defrost operation condition, if digital input turns OFF, defrost output turns OFF also. ON/OFF^{#1} r.dl Manual defrost^{×1} nd F When digital input turns ON, it executes manual defrost. dН *1. Except 1CH, compressor output model (TF31-1 dō Evaporator-fan Control • Parameter 4 group [PR4] (except 1CH, compressor output model: TF31-1 Param To improve the efficiency of cooling, install and control evaporator-fan at evaporator. It is available for compressor+defrost or auxiliary (alarm/evaporator-fan) output model (TF3_-2_ ___). Also RL.E defrost/auxiliary output [5,47] of parameter 1 group should be set as auxiliary [8,45], and auxiliary output [8,45] RL.H should be set evaporator-fan [FRn]. It is available for compressor+defrost+auxiliary (alarm/evaporator-fan) output model (TF3_-3_ H_). Also, auxiliary output [RU+] of parameter 1 group should be set as evaporator-fan [FRn]. R: • Parameter 5 group [PR5] •Evaporator-fan operation [F上 1] Evaporator-fan operation [F上 1] Evaporator-fan operates by two control methods; [JEF] controls evaporator-fan by measured temperature from defrost sensor or [FRn] controls evaporator-fan by compressor/defrost operation. Paran Evaporator-fan control temperature [F,Ł] and hysteresis [F/H] When evaporator-fan operation [F,E] is set as [*d*[*F*] controls (evaporator-fan is controlled by measured temperature [F,Ł], evaporator-fan output turns OFF. Set evaporator-fan control temperature [F,Ł] and evaporator-fan control Сий LЫ temperature [P_E], evaporator-ian output turns OFP. Set evaporator-ian control temperature [P_E] and evaporator-fan control temperature [P_E] and evaporator-fan control temperature setting range: -40 to 99 (°C), -40 to 212 (°F) Evaporator-fan control hysteresis setting range: 1 to 5 (0.5 to 5.0) (°C), 2 to 10 (°F) **Evaporator-fan operation mode** [F $\Re n$] **and evaporator-fan start-up delay time** [P_dr] When evaporator-fan operation [F_E] is set as [F $\Re n$] for control by compressor/defrost operation, it is available to set [F $\Re n$] for evaporator-fan operation mode for compressor/defrost operation. User Manual Visit our homepage (www.autonics.com) to download manuals Parameter Operation method Cautions during Use Frammeter Operation method EF I When compressor operates, evaporator-fan also operates. When compressor operation is finished, evaporator-fan also operation turns OFF. (except compressor operation for hot gas defrost) EF 2 When compressor operates, evaporator-fan operates after the set evaporator-fan start-up delay time. When compressor operation is finished, evaporator-fan operates after the set evaporator-fan start-up delay time. When compressor operation is finished, evaporator-fan operation turns OFF. (regardless of defroster operation) EF 3 When power turns ON, evaporator-fan operates. When defroster operates, evaporator-fan stops. (regardless of compressor operation) . Follow instructions in Cautions during Use . Otherwise, it may cause unexpected accodents. C. Check the polarity of the terminals before wining the temperature sensor. 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. Keep away from high voltage lines or power lines to preven tinductive noise. In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire of invertigent lines. Evaporator-fan operates only when operating compressor or defrost. Evaporator-fan stops when compress FFЧ EFF Evaporation operates from over the term control EF5 Evaporator-fan operates from power ON to power OFF. (regardless of defroster operation of freezer. When door is open (digital input [d1] is set as RUN/STOP [5EP] or door switch [d5^u]), evaporator-fan stops. 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 [Pdr] to prevent warm air inflow, and it may ncrease cooling efficiency. Evaporator-fan start-up delay time setting range: 0.00 to 9.59 (0 min 00 sec to 9 min 59 sec) Defroster operation Defroster operati on perio 10. Install a surge absorber at each end of inductive load coll when controlling high-capacity power relia (inductive load (e.g., magnet). 17. Make sure that power supply voltage reaches to the rated voltage within 2 sec after supplying power. 18. Do not wire to terminals which are not used. 21. This unit may be used in the following environments. ①Indoors (in the environment condition rated in 'Specifications') ③Altitude max. 2,000m ④Installation category II Compressor operation Compressor operation delay operation operation operation Compre Defrost Defrost end time delay Defrost end delay Defrost Defrost cycle Defrost time Defrost cvcle Defrost time Maior Products Defros EE I Pho Fibe Doc Doc Are Pro Pre Rot Cor Swi Cor Ste Gra Fiel Las delay delay delay EE 2 E F B ЕFЧ i EFS

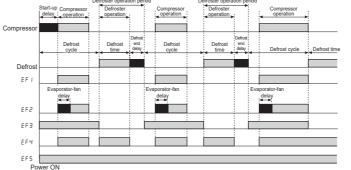
evaporator-fan).

*For more information about parameters for evaporator-fan control, refer to user manual

is set as 60 min and compressor duty ratio when sensor break [dUE] is set as 50%, compressor output has 60 min cycle and

turns ON for 30 min and turns OFF for 30 min.

- operation of master via connected terminals. The defrost parameters of slave(s) are not changed.)
- ※Defrost operation by real-time defrost cycle is not able to synchronize.
- ※Defrost operation of master is prior to the compressor operation of slave. ★For more information about parameters for defrost operations, refer to user manipulation.



Hold K++ keys for 5 sec to reset all parameters in memory to default value.

word function is ON, it is required to enter valid password to reset parameters

Error Display							
ning in turn	Description	Troubleshooting					
^{%1%2} ⇔o₽n	When input sensor is break or sensor is disconnected.	Check input sensor status.					
^{∭1} ↔LLL	If the measured temperature of the dedicated sensor is lower than low-limit temperature among temperature setting range.	It clears when input is within the					
^{ж1} ⇔ННН	If the measured temperature of the dedicated sensor is higher than high-limit temperature among temperature setting range.	display range.					
ыгр	Even though input sensor is normal, freezer temperature does not change over 1.0°C (1.8°F) during loop break alarm monitoring time [L b.R].	Check the compressor and hold the A+♥ key at the same time for 3 sec. It clears when input is within the adequate range.					

X1: □ indicates input sensor number of error display priority which occurs error. Error display priority: Er ↓ (input sensor 1) → Er ≥ (input sensor 2)→ Er ≥ (input sensor 3)→ Er ∪ (virtual temperature) → Er c

Facto	ory Defa	ault									
/ setting [5 u] • Parameter 0 group											
ameter	Factory default				Para	meter	Facto	ry default			
5 u	0				d۴	?.E	5	1			
aramete	r 1 group [P	PR []			ño	o.E	-				
ameter	Factory default	Parameter	Factory default	Paramet	er	Factory d	efault				
nĿ	n 5.H	Unt	٥٢	8U5		oFF					
52	oFF	і Ь.	0	ьυΞ		0.0					
53	d١	d 5.E	0.5		/						
E.r	0	5.d A	dEF								
aramete	rameter 2 group [PR2]										
ameter	Factory default	Parameter	Factory default	Paramet	er	Factory d	efault	Parameter	r	Factory default	
FE	E	n.Su	1	n.E ñ		0		EE		0	
								0.15		7	

F	E	n.5u	1	n.E ñ	0	EE	0
15	1	n.HY	1	E.ño	oFF	R d.C	2
5	0	n.oF	0	SdL	0	ELE	0
iu	99	n.5H	0	696	0	dUE	50
iu	- 40	n.t ñ	0	rdL	0		
id	oFF	n.EH	8	ont	0		

meter	Factory default	Parameter	Factory default	Parameter	Factory default	Parameter	Factory default
F	H.E.n	dEE	30	P.d E	oFF	U.d E	нбн
n	ч	P d.d	0.0 0	d.d E	0	R d.d	1
11	oFF	dr.t	1.0 0	d.G r	oFF	E.d E	oFF
	oFF	Edt	Ч	P.d [oFF		
	oFF	d.H.Y	1	d.P.r	oFF		

neter	Factory default	Parameter	Factory default	Parameter	Factory default	Parameter	Factory default
1L	RL.d	RHY	1	Rn	00	FRn	EFI
.E	RL.R	Ron	0	F.E Y	FRn	P.d r	1.0 0
.н	139	R.o F	0	F.E	ч		
.L	139	E.R.d	0	F.H.Y	1		

meter	Factory default	Parameter	Factory default	Parameter	Factory default	Parameter	Factory default
јн	Random hour	Rdr	0 1	r Ľ.E	20	L.d Ľ	oFF
Jñ	Random min	6P5	96	Co¥	E n.A	L.P	oFF
31	oFF	Prt	non	U5r	SEd	P⊻d	000
⊳R	0	SEP	2	L.5 u	oFF		

DOSC International Formation and instructions, please refer to user manual and user manual for communication, and be sure to follow cautions written in the technical descriptions (catalog, homepage).

Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.

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. 4. Do not apply excessive power when connecting or disconnecting the connectors of the product. 5. Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power. 6. Do not use the unit for other purpose (e.g. voltmeter, ammeter), but temperature controller. 8. 24/AC, 12-24/DC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device

supply device. 15. Make a required space around the unit for radiation of heat.

For accurate temperature measurement, warm up the unit over 20 min after turning on the power. 16. Install a surge absorber at each end of inductive load coil when controlling high-capacity power relay or

ויז דוימושו	Juucis	
er Optic Sensors or Sensors or Side Sensors	Temperature Controllers Temperature/Humidity Transducers SSRs/Power Controllers Counters	
essuré Sensors tary Encoders	Timers Panel Meters Tachometer/Pulse (Rate) Meters Display Units Sensor Controllers	Auton
itching Mode Pow ntrol Switches/Lan Terminal Blocks 8 pper Motors/Drive aphic/Logic Panels Id Network Device	ar Supplies ps/Buzzers Cables rs/Motion Controllers s n (Fiber, Co₂, Nd: yag)	■ HEADQUARTERS: 18, Bansong-ro 513be South Korea, 48002 TEL: 82-51-519-3232 ■ E-mail: sales@autonic

CS Corporation

on-gil. Haeundae-gu. Busan

cs.com

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