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the relevance of the second se	lay output.l necting the nal screw w follow this in follow this in	e sensor input cata e sensor input cata istruction may resu he rated specifical istruction may resu in the unit, and do istruction may resu in the place where on, impact, or salir istruction may resu Information I I - T Option function Compressor Ioad capacity Power supply put	No-mark xz No-mark xz T R ^{%3} A ^{%3} G ^{%1} A H 1 1 4 1 4 1 4 1 4 3	erminal screw with dicated cable, use . m. function due to conta duct damage. r or organic solven ock or fire. plosive/corrosive g esent. losion. g into the unit. duct damage. No option Synchronize defrost RS485 communicati RS485 communicati RCT (real time clock RS485 communicati Compressor 20A 1a Compressor 20A 1a Compressor 20A 1a Compressor 16A 1c 24VAC 50/60Hz, 12 100-240VAC 50/60H Compressor +Defros (alarm/evaporator-fa Compressor +Defros (alarm/evaporator-fa 1CH input (NTC or R 3CH input (NTC or R 3CH input (NTC) [inlet temperature co 999 (3 digit)	a tightening torq AWG 30~14 cable ct failure. t. jas, humidity, dire pas, humidity, dire pas, humidity, dire pas, humidity, dire pas, humidity, dire pas, humidity, dire pas, humidity, dire contact c	and tighten and tighten and tighten ct sunlight, ct sunlight, clock) clock) clock cl
the relevance of the re	lay output. Innecting the nal screw w follow this in init within ti follow this in see the unit is that chip, due follow this in tal chip, due follow this in cring l i j - 3 4 Output Output Output Number of	e sensor input call e sensor input call instruction may resu he rated specifical in the unit, and do instruction may resu in the unit, and do instruction may resu in the place where on, impact, or salin istruction may resu struction may resu nformation M - T Option function Compressor load capacity Power supply but	signed are to ble without de to ble without de to ble without de titions. It in fire or proc. not use wate it in fire or proc. not use wate it in fire or proc. not use wate procession it in fire or explicitly may be provide from flowin it in fire or explicitly may be provided from the from flowin. No-mark %2 R ^{%3} A ^{%3} G ^{%11} A H 1 4 1CH 1 1CH 2 3CH 3 1 3 TF	erminal screw with dicated cable, use , m. function due to conta duct damage. r or organic solven ock or fire. polosive/corrosive g esent. losion. g into the unit. duct damage. No option Synchronize defrost RS485 communicati RS485 communicati RS485 communicati Compressor 20A 1a Compressor 20A 1a Compressor 20A 1a Compressor 20A 1a Compressor 20A 1a Compressor 5A 1a c Compressor 16A 1c 24VAC 50/60Hz, 12 100-240VAC 50/60H Compressor+Defros (alarm/evaporator-fa Compressor+Defros (alarm/evaporator-fa SCH input (NTC O) [inlet temperature c 999 (3 digit) Refrigeration Temper	a tightening torq AWG 30~14 cable ct failure. t. gas, humidity, dire particular, direction part, and the second second part, and the second second second part, and the second se	e of 0.5N-m and tighten ect sunlight, ect su
the relation of the second sec	lay output. Innecting the nal screw w follow this in init within ti follow this in ise the unit is that chip, due follow this in at chip, due follow this in that chip, due follow this in cring l i j – 3 (4) c c c c c c c c c c	e sensor input call e sensor input call instruction may resu he rated specifical intruction may resu in the unit, and do instruction may resu in the place where on, impact, or salin istruction may resu istruction may resu nformation H - T Option function Compressor load capacity Power supply put compressor output nodel (TF33	Sole without de of clahimitations. It in fire or proceof 0.2N-i It in fire or proceof 0.2N-i It in fire or proceof or not use wates It in electric she flammable/ex It in fire or exploit it in fire or exploit it in fire or exploit the from flowin It in fire or proceof or not the flammable of th	erminal screw with dicated cable, use , m. function due to conta duct damage. r or organic solven ock or fire. polosive/corrosive g esent. losion. g into the unit. duct damage. No option Synchronize defrost RS485 communicati RS485 communicati RC (real time clock RS485 communicati Compressor 20A 1a Compressor 20A 1a Compressor 20A 1a Compressor 20A 1a Compressor 20A 1a Compressor 16A 1c 24VAC 50/60Hz, 12 100-240VAC 50/60H Compressor+Defros (alarm/evaporator-fa Compressor+Defros (alarm/evaporator-	a tightening torq AWG 30~14 cable ct failure. t. gas, humidity, dire pas, humidity, di	and tighten bet sunlight, bet sunlight, bet sunlight, bet sunlight (DI)] betaute the sum of
the relation of the termination of terminatio of termination of termination of te	lay output.l. nnecting the nal screw w follow this in nit within it follow this in follow this i	e sensor input call e sensor input call instruction may resu he rated specifican istruction may resu in the unit, and do istruction may resu in the place where on, impact, or salif instruction may resu struction may resu istruction may resu of the place where on, impact, or salif istruction may resu istruction may resu of the place where istruction may resu istruction may resu of the place where istruction may resu istruction may resu	Algebra the eta of the second	erminal screw with dicated cable, use . m. function due to conta duct damage. r or organic solven ock or fire. plosive/corrosive g esent. losion. g into the unit. luct damage. No option Synchronize defrost RS485 communicatii Compressor 20A 1a Compressor 20A 1a Compressor 20A 1a Compressor 20A 1a Compressor 20A 1a Compressor 16A 1c 24VAC 50/60Hz, 12 100-240VAC 50/60H Compressor 10A 1c 24VAC 50/60Hz, 12 100-240VAC 50/60H Compressor 10A 1c Compressor 4Defros (alarm/evaporator-fa Compressor 4Defros (alarm/evaporator-fa 1CH input (NTC or R 3CH input (NTC or g999 (3 digit) Refrigeration Temper 1G). tion is varied by com	a tightening torq AWG 30~14 cable ct failure. t. jas, humidity, dire pas, humidity, di	and tighten and ti
the relation of the termination of term	lay output.l. nanecting the nanecting the nanecting the nanecting the nanecting the nanecting the sector of the sector of the sector of the sector of the sector of the sector of the sector of the sector of the se	e sensor input cata e sensor input cata instruction may resu he rated specificat intruction may resu in the unit, and do istruction may resu in the place where on, impact, or salin istruction may resu istruction may resu istruction may resu istruction may resu nformation Option function Compressor load capacity Power supply but compressor output nodel (TF33 n Synchronize defrost function	Image: second secon	erminal screw with dicated cable, use , m. function due to conta duct damage. r or organic solven ock or fire. plosive/corrosive g esent. losion. g into the unit. duct damage. No option Synchronize defrost RS485 communicatii RCT (real time clock RS485 communicatii Compressor 20A 1a Compressor 40A 1	a tightening torq AWG 30~14 cable ct failure. t. jas, humidity, dire pan, humidity, dire contact conta	and tighten bet sunlight, and and tighten bet sunlight, be
the relation of the second sec	lay output.l. necting the nal screw w follow this in init within it follow this in idoth to clean follow this in the the unit it is the unit is the unit is is the unit is the unit is output the unit is the unit is output the unit is the unit is is the unit is the unit is output the unit is the unit is is the unit is the unit is the unit is output the unit is the unit is the unit is output the unit is the unit is the unit is output the unit is the unit is the unit is output the unit is the unit is the unit is the unit is output the unit is the unit is the unit is output the unit is the u	e sensor input cat e sensor input cat he rated specification instruction may resu in the unit, and do instruction may resu in the unit, and do instruction may resu in the place where on, impact, or sall instruction may resu information H – T Option function Compressor load capacity Power supply put compressor output input channels compressor output nodel (TF33	ble without die t ble without die t ble without die t tions. It in fire or proc not use wate It in electric sh lit in electric sh lit in fire or expl tin fire or ex	erminal screw with dicated cable, use , m. function due to conta duct damage. r or organic solven ock or fire. polosive/corrosive g esent. losion. g into the unit. duct damage. No option Synchronize defrost RS485 communicati RC (real time clock RS485 communicati Compressor 20A 1a Compressor 20A 1a Compressor 20A 1a Compressor 16A 1c 24VAC 50/60Hz, 12 100-240VAC 50/60 Compressor +Defros (alarm/evaporator-fa Compressor +Def	a tightening torq AWG 30~14 cable ct failure. t. pas, humidity, dire on contact contac	and tighten and ti

Spec	ificatio	ns				Connections TE31-1 G
del	5	TF31-	1	TF33]	
nber of cha	annels	1CH		3CH		25
ver A plv A	C power	$100-240$ VAC \sim 50/60 24VAC \sim 50/60Hz. 12	HZ 2-24VDC			RE
wable volt	tage range	90 to 110% of rated v	oltage			
er A	C power	Max. 8VA (100-240VA	C~ 50/60Hz) 50/60Hz) Max 3W (1)	2-24VDC)		123456
play metho	od	7 Segment LED meth	od (red)	21100)		
aracter size	e (W×H)	9.4×19.3mm				NTC 5K/10K
ut type R	RTD	DPt100Ω		_		
npling peri	iod	500ms	500) - 400 - 4 I'' 'I	<u> </u>	1000-11-11	DPt100
Compi	acy ressor (COMP)	250VAC~ 5A, 30VDC	(50) (10)	A, 24VDC 16/	A, 1c/250VAC~20A 1a	• TE33
but Defro	st (DEF)	250VAC \sim 10A, 24VE	0C 10A, 1a			COMPO
Auxilia	ary (AUX)	250VAC~ 5A, 30VD0	C 5A, 1a	RS485 comm	inication output	250VAC 30VDC 5
nmunicatio	on output	-		(Modbus RTU)	LOAD
ital input		Contact input: ON Ma	x. 1kΩ , OFF Min. 100 residual voltage: Max	kΩ 1V OFF leakar	ne current: Max. 1mΔ	S1 S2 S3 COM
tur input		outfl	ow current: 4µA	rv, or r iounuş	je ourrent. max. mir t,	123456
teresis	bd	ON/OFF control	variable			
Compr	5A 1a	Mechanical: 5,000,00	0 operations, Electrica	al: 50,000 oper	ations (250VAC 5A)	
ay (COMF	P) 16A 1c	Mechanical: 20,000,0	00 operations, Electric	cal: 30,000 ope	erations (250VAC 16A)	NTC 5K/10K SYNCH
e Defro	IST (DEF)	Mechanical: 20,000,0	00 operations, Electric	al: 100,000 op	perations (250VAC 20A)	DIGITAL INPUT
Auxilia	ary (AUX)	Mechanical: 5,000,00	0 operations, Electrica	al: 50,000 oper	ations (250VAC 5A)	WA Only for any date
nory reten ilation resi	istance	Approx. 10 years (nor Min_100MO (at 500V	1-volatile memory met DC megger)	hod)		defrost+auxiliary (alarm/ev
ectric A	C power	3000VAC 50/60Hz for	1 min (between all ter	minals and cas	se, power and input circuit)	※2: Only for compressor+defree
ngth A	C/DC power	1000VAC 50/60Hz for	1 min (between all ter	minals and cas	se, power and input circuit)	%3: Only for synchronize defro
se resistar ation	nce	1.5mm amplitude at free	the noise simulator (pul quency of 10 to 55Hz (fo	or 1 min) in eacl	±2KV R-phase and S-phase h X. Y. Z direction for 2 hours	Dimensions
ironment A	mbient temp.	-10 to 50°C, storage:	-20 to 60°C		,	TE3 Sorios
A	mbient humi.	35 to 85%RH, storage	e: 35 to 85%RH			
tection stru	ucture	IP65 (front case)	01 (3832). 1			
oroval		(E @				
ight [*] '	dieplay uni	Approx. 207g (approx	. 105g)			
	TED-3		ateryj	1 5mm amplitu	de at frequency of 10 to 55Hz	interests
ver supply	3.3VDC	1100	Vibration	(for 1 min) in ea	ach X, Y, Z direction for 2 hours	
er consumpt	tion Max. 1W	at LED mathed (rad)	Enviorn- Ambient temp.	-10 to 50°C, s	storage: -20 to 60°C	 NTC sensor (5kΩ)
nm. metho	od Serial (TT	L Level), Half duplex	Protection structure	IP67	1, Storage: 55 to 65%RH	
nm. cycle	100ms	<i>i</i>	Approval	(€ 🕅		
	Ø2.5mm,	3m Ø2.5mm, 5m	Weight ^{*1}	Approx. 77g	(approx. 48g)	ž <u>t</u>
nvironmen	nt resistance i	s rated at no freezing o	parentineses is for unit or condensation.	only. The weig	Int is valied by model option.	
Dart	Docorir	otion				
Faili	Descrip					
2	1	8 9	1. Present value	e (PV) display	component (red):	Max. 15 ▲ Max. 15 ▲
			Setting mode: D	Displays preser	meter and setting value.	4 200
TF3			 Deviation ind Displays devia 	licator (: gre	en, ▼/▲: red):	○ TFD (sold separately)
			setting value ((SV).	it value (F v) based off	50
			PV deviation	Deviation of	display	
Autonics			More than 1.8	°C indicato	r turns ON	
		7 11 10	Within ±1.8°C	indicato	r turns ON	
íl –		<u>л ()</u>	Less than -1.8	8°C ▼ indicato	r turns ON	
	۳.	T L	3. Compressor Turns ON for	(COMP) outp compressor ou	ut indicator (green): itput. In case of	
11 U			compressor p	rotection opera	ation and output does not	
1∥ ¶		∃♥	When operatin	ng compresso	r continuously, it turns ON	
U-		12	for 2 sec, and	turns OFF for	1 sec.	
efrost (DE	EF) output in	dicator (green):				E Domoto Dion
urns ON fo urns ON fo	or defrost outp or 2 sec and 0	Dut. Flashes for defrost DFF for 1 sec for manu	delay operation. al defrost or Power O	N defrost.		Remote Displ
vaporator	r-fan (FAN) o	utput indicator (gree	n): r delay operation of ev	anorator-fan d	outout	
uxiliary (A	AUX) output	indicator (green):	delay operation of ev		Juiput.	. 100
nit indica	or alarm outpu I tor (red) : Dis	ut. Flashes for delay op splays temperature uni	eration of alarm outpl it set at temperature u	ut. nit [ปกะ] of pa	rameter 1 group.	
(MODE)	key: Used for	entering parameter set	ting group, returning RI	UN mode, mov	ing parameter or saving SV.	TFD Autonics BUE BUT
Hold the ke	ey over 3 sec	to select active/inactiv	e auxiliary output in R	UN mode.		
→ (DEF) H Hold the ke	key: Used for ey over 3 sec	to execute/stop manual	oup or changing settir al defrost in RUN mod	ng value. le.		*When connecting TFD to th
(COMP Hold the ke) key :Used f ev over 3 sec	or entering SV setting to active/inactive com	group, changing settir pressor output in RUN	ng value, movi I mode	ng digits.	converter, sold separately) f
When buzz	zer alarm occ	urs, press the key onc	e to stop the sound. ((Only for 3CH in	nput,	SCM-38I(RS232C to RS485
Suzzer [68	<pre>>F+defrost+au JE] of parame</pre>	eter 1 group is set as [or-ian) output model (])	TF33-3□□F□)	supports buzzer.	SV Settings
Data load t is for dise	er port: playing TF3 d	ata at remote display	unit (TFD) by connecti	ing phone-iack	. In other case, for	You can set the temperature to
connecting	Autonics SC	M-US (USB/Serial con	verter, sold separately	y), it is a PC lo	ader port of serial	Set range is within SV low-lim
loo4			ature Dance	•		E.g.) In case of changing SV f
mput	туреа	and remper	ature Range	ť	·	(1) TE3
ut type	1	Decimal point Displa	y method Temperatu	ure range (°C)	Temperature range (°F)	
		1 ^5/	H -40 to 99		-40 to 212	
	NTC 5kΩ	0.1 .5	-40 to -20	0.0	-19.9 to 99.9	Autonics
ermistor	L		-19.9 to 9	9.9	100 to 212	Press any key among
C)		1	H -40 to 99		-40 to 212	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
			-19.9 to 99	9.9	100 to 212	3
 *1	DDt 4000	1 dP.	H -99 to 99		-148 to 212	
		0.1 dP.	-99 to -20	9.9 ^{×2}	-148 to 212	
F3 Series	displays only	3 digits. If PV decimal	number of shaded ter	mperature rang	ge is out of 3 digit,	Autonics
F3 does no	ot display the	numbers below decim	al point. You can cher	k it at the com	prehensive device	L

ment 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.

	• TF31-1 G • TF31- A	
	COMP OUT 2500VAC 5A 2500VAC 20A RESISTIVE LOAD COAD	DEF OUT 250VAC 10 24VDC 10 RESISTIV LOAD*1
		89
±2°C±1 digit ≫ 20A 1a	SENSOR DIGITAL INPUT 12-24VAC SUBUHZ, SENSOR DIGITAL INPUT • TF33A • TF33H	
put	COMPOUT DEFOUT AUXOUT COMPOUT DE 250WC5A 250WC5A 220WC5A 220WC6A 25 30VDC5A 24VDC10A 30VDC5A 24VDC16A 24 RESISTIVE RESISTIVE R	FOUT OVAC 10A VDC 10A SISTIVE AD ^{×1}
ax. 1mA,	$\begin{bmatrix} s_1 & s_2 & s_3 & com \\ 1 & 2 & 3 & 4 \\ 1 & 2 & 4 & 5 & 6 & 7 & 8 & 9 & 10 & 11 & 12 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 10 & 10 & 10 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 10 & 10 & 10 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 10 & 10 & 10 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 10 & 10 & 10 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 10 & 10 & 10 & 10 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 10 & 10 & 10 & 10 & 10 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 10 & 10 & 10 & 10 & 10 & 10 & 10 $	89
/AC 5A) VAC 16A) 0VAC 20A)		
/AC 5A)	DIGITAL INPUT 24VAC SURVEX, DIGITAL INPUT 12-24VDC 12-24VDC %1: Only for compressor+defrost or auxiliary (alarm/evaporator-fan) output model (TF32), compressor+ defrost+auxiliary (alarm/evaporator-fan) output model(TF33).	
d input circuit) d input circuit) e and S-phase	X2: Only for compressor+defrost+auxiliary (alarm/evaporator-fan) output model (TF3-1-3-1-). X3: Only for synchronize defrost function model (TF33-1-A-S), or RS485 communication model (TF33-1-A-T/A).	
uon tor 2 nours	DIMENSIONS TF3 Series (unit: mm)	[] []
		and us from o
y of 10 to 55Hz ction for 2 hours		Syster Opera Memo
5 to 85%RH	• NTC sensor (5kΩ) AWG22 * TPE lead wire * Tref lead wire * Bracket	Hard o VGA
) y model option.		This f
t (red):		param Maske For m
etting value. e d): based on		Visit o Before
		The al model
(green):		This fu easily
put does not y, it turns ON	3m or 5m TF3 Min. 100 ^{%1} Min. 55 70.3 ^(a) 70.3 ^(b) 28.2 ^(b) 6 TFD Min. 65 Min. 40 45.7 ^(b) 45.7 ^(b) 25.4 ^(b) 3 %1. When connecting remote display unit (TFD),	manag For m Visit o
	or SCM-US, Min. 120 Remote Display Unit (TFD) [sold separately]	RUN
	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	The al
oup. r or saving SV.	port of TF3. This unit is dedicated for TF3 Series and it does not directly 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.	
	When connecting TFD to the data loader port of TF3, you cannot connect Autonics SCM-US (USB to Serial converter, sold separately) for communication. Use SCM-US48I(USB to RS485 converter, sold separately), SCM-38I(RS232C to RS485 converter, sold separately).	(C
zzer.	SV Settings	If the t tempe Virtual
serial	Set range is within SV low-limit value [L 5u] to SV high-limit value [H5u]. E.g.) In case of changing SV from 19°C to 10°C	tempe Virtua
e range (°F)		If virtu If virtu
9	Artesis Image: Constraint of the second s	⊏.g.) li s
9	mode to enter into SV setting mode. $(10^{\circ} \rightarrow 10^{\circ} \rightarrow 10^{\circ} \rightarrow 10^{\circ})$ Last digit $(10^{\circ}$ digit) on SV display part flashes.	Setting
diatit		(C You ca Parar
uiyit,	Autonics (V	

Press (MODE) key to save the set value.

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

Press B, R key to raise or lower the set value. (9 \rightarrow 0)



Comprehensive Device Management Program [DAQMaster]

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

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

Parameter Mask

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

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

e applying mask PR I + I nt + 52 + 53 + utr + Unt ...

rapplying mask

bove is masking input sensor 3 selection [53], temperature unit [Unt] of parameter 1 group for 3CH input (TF33-000-0

Parameter User Group [PRU]

unction is able to set the frequently used parameters to the user parameter group. You can quickly and set parameter settings. User parameter group can have up to 30 parameters in the comprehensive device igement program (DAQMaster). nore information, refer to the DAQMaster user manual.

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

mode

PRU PRI ··· PRS

d5L → H35 → AH3 → dEF → dEL → RH3 above is setting user parameter group in the DAQMaster with delay display period [d5L] of parameter 1 p, hysteresis [H35], night mode hysteresis [AH3] of parameter 2 group, defrost method [dEF], defrost time] of parameter 3 group, alarm output hysteresis [RH3] of parameter 4 group.

Virtual Temperature Rate [ut.r]

only for 3CH input model: TF33-

e of 3CH input model (TF33rearture [: 5]. You can set virtual temperature rate. temperature of inlet and outlet is significantly different at freezer, virtual temperature helps to control erature efficiently.

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

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

al temperature (PV)= + [virtual temperature rate × input sensor 2 temperature] 100

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

ual temperature rate [uEr] is set as [100], virtual temperature (PV)= input sensor 3

finlet temperature of input sensor 1 is 0°C, and outlet temperature of input sensor 3 is 10°C,

- set virtual temperature rate [μ E,r] as [50] and virtual temperature is 5°C to control temperature. 5= [{100-50}×0]+ [50×10]
 - 100

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

Display Selection [d P.L]

only for 3CH input model: TF33-

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

meter	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).
υ5	Displays virtual temperature.

Parameter Group	RUN mode										1
Press any key among	© 2 sec										@ 3 sec
	₽5_ ×1										
When PW is valid When PW is val	id When PW is va	alid									
SV setting Display selection	Parameter user group	Parameter 1 group	Pa	arameter 2 group [PR2]		Parameter 3 gro	₩ *	Parameter 4 gro	up 🔺 🖄	Paramet	er 5 group R 5]
Saved automatically after 3 sec											0
Monitoring time [ā a.Ł]	User parameter 0	Input type [I n E]	Comp. o	output mode [a	FE]	Defrost method & operat	ion [dEF]	Alarm operation mo	de [AL]	Current hou	и [[UH]
■ 01.5 sec	@ 1.5 sec	▲ [©] 1.5 sec _©	■ 0 1.5	5 sec		▲ [©] 1.5 sec ©		▲ [©] 1.5 sec		▲ @ 1.5 sec	0
Max. value [HP比]	User parameter 1 to 29	Input sensor 2 ON/OFF [52]	Hystere	esis [H y 5]		Defrost cycle [dl n]		Alarm option [AL.E]		Current minu	te [[U n]
Min. value [L.P Ľ]		Input sensor 3 selection [53]	Offset [d	oF5]		Real-time defrost cycle	e [r.dl]	Alarm high-limit deviat	ion [ALH]	Digital input (di]
© 1.5 sec	0	Temperature unit [Unt]	SV low-	-limit (L S)	_	hour [dH 1]		Alarm hysteresis [A	(HA] IOU (VET]	monitoring tir	ne [L b A]
		Input correction 1 [/ b. /]	Night m	node [nād]		Real-time defrost cy min [d ā 1]	cle 1:	Alarm ON delay tin	ne (Ron)	Comm. addre	ess [Adr]
		Input correction 2 [/ b.2]	Night mo	ode SV correction	[^2^]	:		Alarm OFF delay tir	me [A_0 F]	Comm. parity	/ bit [Pr E]
		Delay display period [d5.E]	Night m	node offset [n.o.	-]	Real-time defrost cy hour [dHB]	cle 8:	Alarm output metho	ine (c.n.a.) id (R.n.)	Comm. stop	bit [5£P]
		Defrost/auxiliary output [5.d R]	Night m	node start hour	[n.5H]	Real-time defrost cy min [dਨ8]	cle 8:	Evaporator-fan operat	ion [F.£ Y]	Comm. respons	e wait time [r 또)
		Auxiliary output [AU5]	Night m	node start min [n.5ñ]	Defrost time [dE L]		Evaporator-fan con temperature [F.Ł]	itrol	User level [U	5r]
		©	Night m	node end nour	<u></u>	Pump down delay tim	e [Pdd]	Evaporator-fan hystere	esis (F,HY)	SV setting gr	oup lock [Ł.5 u]
※1. [P5] parameter appears only when password is set. The default password is [000]. If password is not valid approximate the password is [000].	d, the	_	Tempera	ature monitoring	[Eño]	Defrost end temperatu	≂ (ar.≿) re (Ed£)	Evaporator-fan mod	le [FAn]	Front key loc	K [L.d.Ľ]
password code appears. Press any key among the <u>key</u> keys to return to password entering window. Press th (MODE) key to return to RUN mode	e 🔘		Comp. st	tart-up delay time	[5dL]	Defrost hysteresis [(HA]	delay time [P.d.r.]	all ap	PA user group to	p lock [LPU]
If you forget password, contact Autonics after checkir password code.	ng		Comp. m	nin. operation cycle	[[4C]	Defrost when power C	N [P.dE]	0		PA 1 group lo	ock [L.P 1]
※2. It appears when setting user parameter group in the comprehensive device management program (DAQM)	laster).		Comp. m	nin. operation time	[ont]	manual defrost [d.d 8	wer ON/			PA 2 group lo	ick [L.P.2]
*Press the (MODE) key after changing the setting to SV.	save the		Comp. co	ontinuous operatio	n [[[]	Defrost group [dur]				PA 3 group to	ck [L.P.H]
*Hold the @ (MODE) key for 1.5 sec while in setting me move to the parameter group. *Hold the @ (MODE) key for 3 sec while in setting model.	e to return		Alarm d	delay time after ous operation	AGE]	Parameter copy [P.a	сј п [d.Р.~]			PA 5 group lo	ock [L.P.5.]
RUN mode. %Press the @ (MODE) key at the last parameter of eac	h		Comp. of sensor bi	peration cycle wh preak [[[[[]]]	en	Defrost time unit [U.	E]			Password [P	:d]
parameter group, it moves to that parameter group nar can move to other groups with 딸, 종 keys.	ne. You		Comp. de	luty rate when ser	ISOF	Alarm delay after de door open [Rdd]	frost/		l		
into setting mode, it will be automatically returned to RI and previous setting value will be remained.	UN mode		0			Temperature display	during				
%The shaded parameters are displayed when user level parameter 5 group is set as standard level [5Łd].	[U5~] of © 3 sec	© 3 sec		© 3 s	ec	0 03	sec	ø	3 sec		© 3 sec
Compressor Protection This function is for preventing compressor from life cy ON/OFF of compressor. As compressor protection se compressor (COMP) output indicator (green) is flashi e Compressor start-up delay time [5dt 1	rcle shortening or malfunct ttings, when compressor o ng.	ion by overload and frequent utput does not ON, the front	W of ar Se	Defro /hen operating f compressor round of evap et defrost cyc	st C g a con is decr orator. le, time	mpressor for a long ti reased. For increasin e, and end temperatu	ept 1CH me, an e g therma re, etc to	H, compressor vaporator and a free l efficiency, defrost o operate defrost (he	output ezer are fr operation eater/hot-g	model: TF eezing and the helps to remove gas defrost).	31-1) ermal efficiency ve frost or ice
If power turns ON instantly from break-down or power Setting range: 0 to 60 (min)	OFF, it delays start-up du	ring the set time of compresso	r. de	he front defro elay operatior	st (DE 1.	+) output indicator (g	reen) turr	ns ON during defros	t output a	nd it flashes d	uring defrost
• Compressor restart delay time [r dL] To prevent frequent compressor ON/OFF, set compre-	ssor ON time after compre	ssor turns OFF.	in op	peration is av	ailable	when defrost/auxiliary	(alarm/e ry output	vaporator-tan) outpi [5.∂R] of parameter	1 group is	set as defros	i), defrost it [dEF].
 Setting range: 0 to 60 (min) Compressor min. operation time [ant], Com 	pressor min. operation	n cycle [[님[]	P	Parameter	Defr	rost method De	frost ope	eration			
To prevent frequent compressor ON/OFF, set min. op Setting range of compressor min. operation time: 0 to	eration time and min. oper 60 (min),	ation cycle.		HER GER	Hea Hot-	-gas defrost Ol	perates d	uring the set defros	t cycle/tim	ie	
Setting range of compressor min. operation cycle: 0 to Compressor Comp	p 60 (min) pressor Compre ration avoid L L min aport	essor		HLE E G E E	heat	ter defrost O	perates w frost cvc	when PV is lower that le/time (only for 3CH	n defrost input mo	end temperati	ure during the s
Compressor think operation cycle to think operation cycle to the start-up to t	Nation cycle ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓		•	Defrost cyc	le [d]	n], Defrost time [a	EE]		- inpactine		
Compressor restart	Compressor Compressor Compressor	Compressor estart delay min. operation	Se De	et defrost cyc efrost cycle s	le and etting i	time to operate defro range: 0 to 24 (hour)/	st at eve 0 to 100	ry set cycle and dur (min)	ing the se	et time.	
			De *	Compressor	tting ra	ange: 1 to 100 (min/s tion during defrost is	ec) varied by	defrost method. In	case of he	eater defrost,	compressor
sv.	\checkmark \land	Hyste	resis	varied by eva	orre, a aporato	or-fan operation mod	e setting.	defrect operates at	turns ON.	Evaporator-la	t roal time defr
			Time	cycle [r.d/] c	of para	meter 3 group as [an] and 8 r	eal-time defrost time	every spe es are ava	ilable to set.	real-time dent
Comp. ON i and i a		1×4	•I Se	Defrost end et defrost end	temp temp	erature [Edb], Defr erature and defrost h	o st hyst ysteresis	eresis [dHH] (only from input sensor 2	for 3CH (defrost t	input model temperature).	When the
%1. When starting compressor, if present value (PV) not turn ON and the compressor (COMP) output	is out of hysteresis range, i indicator is flashing during	compressor output does g compressor start-up delay ti	me. st	topped. It is a	vailabl	re of defrost sensor is le when input sensor	same as 2 ON/OF	s the set defrost end F [52] is set as [on]	and defro	ture, defrost o ost method an	peration is d operation [dE
%2. When compressor delay is completed and it is w does not turn ON and the compressor (COMP) of	ithin compressor min. oper output indicator is flashing.	ration cycle, compressor outpo (The latest one has priority	it IS De	set as [REE] efrost end ter	or [6.5 nperat	E J. ture setting range: -40) to 99 (°(C) / -40 to 212 (°F)			
between compressor restart delay time and com %3. When present value (PV) is out of hysteresis, co	pressor min. operation cyo mpressor output does not	cle.) turn ON and the	•	Manual defr	ost	aung range. T to 5 (T.	0 10 5.0)	(0)/21010(F)			
 compressor (COMP) output indicator is flashing %4. If present value (PV) is below the SV, compressor 	during compressor restart or output maintains ON sta	delay time. tus during compressor	E) Se	xecute defros etting. Hold th	t manu e front	ually regardless of the test of test	e set defr , turn ON	ost cycle which con I the digital input wh	sists of de en digital	efrost method : input [d1] of p	and operation arameter 5 gro
min. operation time. After compressor min. operation with the compressor output does not turn ON due to compressor protection the compressor (COMP) output does not turn on the compressor (COMP) output does not turn on the compressor matching t	ation time, it turns OFF. pressor output condition or	parameter settings for	is Tř	set as [ndF] he front defro	to ope st (DE	erate defrost during th F) output indicator tu	e set def ms ON fo	rost time. or 2 sec and turns O	FF for 1 s	ec during mar	nual defrost. Ho
★For more information about parameters for compress	ssor prevention, refer to us	er manual.	th st	ie front 👿 key tarts.	over	3 sec or turn OFF the	digital ir	put during manual o	defrost, ar	nd the set defr	ost cycle re-
Compressor Control Whe	en Sensor Bre	ak	•	Defrost syne RS485 com	hron nunic	ization (only for sy	nchroniz	ze defrost functio	n model:	TF33-□□A-	S,
If normal temperature control is impossible due to sense cycle and duty ratio to protect control object. Until error	sor break, it controls compr r is cleared, operation cycle	ressor output by the set operat e and duty ratio are applied	on W	/hen connecti erminal/RS485	ng ove	er 2 units of TF3, defr munication.	ost and c	, compressor operatio	n is able t	o synchronize	via synchroniz
repeatedly. When error is cleared, the compressor ope and compressor restart delay time.	erates after completing the	currently applied operation cyo	le It A-	is available fo -T/A).	or sync	chronize defrost functi	on mode	I (TF33-□□A-S), or	RS485 co	ommunication	model (TF33-
Compressor operation cycle when sensor b Set compressor operation cycle when sensor break.	reak [LLE]		[5 1.	Setting Order	h othe	er synchronize termin	als or RS	485 communication	terminals	of the units w	/hich are
Set as [J] and compressor output turns OFF when se Setting range: 0 to 100 (min)	nsor break.		2.	synchronized Set defrost o	d for de ycle [d	efrost. dl n] same as among	the units	. (if error occurs, de	frost cycle	e is the setting	j of each unit)
Sompressor duty ratio when sensor break. Set compressor ON duty ratio when sensor break. Setting range: 0 to 100 (0)	oucl		3. 4.	. Set defrost g According to	roup [defros	dur] as 1 master uni st operation of Maste	t [ក85] a , the defi	nd slave unit(s) (up rost operation of sla	to 5 units) ve(s) exec) [51 A]. cutes. (when c	hanging the
		Operation cycle (60 min)		detrost parar	neters	s or master, defrost op	erations	or slave(s) are also	cnanged	iorcibly as sar	ne as the defro

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 $[RU_5]$ 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 A PV -10°C SV 0°C PV 20°C High-limit deviation [R⊥,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 [ALL]: 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. $R_{L,b}$ Alarm latch $^{\times 1}$ 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. Standby AL.C When power is supplied and it is an alarm condition, this first alarm condition is ignored and 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 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 9 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 evaporator-fan according the door status. - 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. 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 15. open time. 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 con ion, defrost output turns ON d١ EdF When digital input turns ON and it is derived operation conductor, derived output turns OFF. Even though it is defrost operation condition, if digital input turns OFF, defrost output turns OFF also. ON/OFF^{*1} Manual defrost^{×1} nd F When digital input turns ON, it executes manual defrost. dН *1. Except 1CH, compressor output model (TF31-1 dā Evaporator-fan Control (except 1CH, compressor output model: TF31-1 Parar 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 defrost/auxiliary output [5_1A] of parameter 1 group should be set as auxiliary [AU+], and auxiliary output [AU+] 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: •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 Substantial end of the temperature of the product of the product operator. • Evaporator-fan control temperature [F±] and hysteresis [F±] with the evaporator-fan controlled by measured temperature from defrost sensor), and the temperature of defrost sensor is same as evaporator-fan control temperature [F±], evaporator-fan output turns OFF. Set evaporator-fan control temperature [F±] and evaporator-fan control temperature [F±] and evaporator-fan control temperature [F±]. 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. Parameter Operation method Operation method 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) When compressor operates, 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) When power turns ON, evaporator-fan operates. When defroster operates, evaporator-fan stops. (regardless of compressor operation) EE I EE 2

■ Alarm (except 1CH, compressor output model: TF31-1□□)

- EF3
- Evaporator-fan operates only when operating compressor or defrost. Evaporator-fan stops when compress EЕЧ
- Evaporation-fail operates only when operating compression of endot. Evaporation-fail stops when compress and defroster stops. (for above zero temperature control) 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 [5]: P] or door switch [d5 \leq]), evaporator-fan stops. EES
- f 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)



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

- 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 manu

is set as 60 min and compressor duty ratio when sensor breal

[dUE] is set as 50%, compressor output has 60 min cycle and

output OFF

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

Parameter Reset

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

Set [1 n]] parameter to [9E5] to reset all parameters.

n case pas word function is ON, it is required to enter valid password to reset parameters Password is also rese

Error Display									
lashing in turn	Description	Troubleshooting							
r □ ^{%1%2} ↔o Pn	When input sensor is break or sensor is disconnected.	Check input sensor status.							
r□ ^{%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							
г □ ^{ж1} ↔ННН	If the measured temperature of the dedicated sensor is higher than high-limit temperature among temperature setting range.	display range.							
гг⇔≟ЬЯ	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 ⓐ+♥ 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

2: Eru (virtual temperature) is not applicable.

Factor	ory Defa	ault								
SV setting [5u] • Parameter 0 group										
Parameter	Factory default				Parar	meter	Facto	ry default		
5 u	0				dP	?.E	5	1		
Paramete	r 1 group [P	PR []			ña	n.E	-			
Parameter	Factory default	Parameter	Factory default	Paramet	er	Factory d	lefault			
Int	n 5.H	Unt	٥٢	RUS		oFF				
52	oFF	Г Б.	0	ьυΞ		0.0				
53	dГ	d 5.E	0.5		/					
ut.r	0	5.d R	dEF							
Paramete	r 2 group [^p	P82]								
Parameter	Factory default	Parameter	Factory default	Paramet	er	Factory d	lefault	Paramete	er	Factory default
oFt	E	n.5u	1	n.E ñ		0		55		0
HYS	1	~HY	1	E.ño		oFF		Я d.C		2

oFt	E	n.5u	1	n.E ñ	0	55	0
HY5	1	n.HY	1	E.ño	oFF	R d.C	2
oFS	0	n.oF	0	SdL	0	ELE	0
HSu	99	n.5H	0	696	0	dUE	50
LSu	- 40	n.t ñ	0	rdL	0		
nād	oFF	n.E.H	8	oot	Π		

Parameter 3 group [PR3]

Parameter	Factory default						
dEF	H,E ñ	dEt	30	P.d E	oFF	U.d E	нбн
din	Ч	P d.d	0.0 0	d.d E	0	R d.d	1
r.dl	oFF	dr.t	1.0 0	d.G r	oFF	E.d E	oFF
dH	oFF	Edt	ч	P.d C	oFF	\sim	
dā	0.E.E	484	1	dPc	0.E.E	۔ ۱	

• Parameter 4 group [PR4]

Parameter	Factory default						
RL	RL.d	RHY	1	Ro	00	FRn	EFI
RL.E	RL.R	Ron	0	F.E S	FRn	P.d r	1.0 0
RL.H	139	R.o F	0	F.E	ч	\sim	
ALL	139	E.R.d	0	F,HY	1		

• Parameter 5 group [PR5]

		-					
Parameter	Factory default						
СИН	Random hour	Rdr	0 1	r Ľ.E	20	L.d Ľ	oFF
EUñ	Random min	6P5	96	Coy	E n.R	L.P	oFF
di	oFF	Prt	non	USr	Std	P⊻d	000
L Ь Я	0	SEP	2	L.5 u	oFF		

User Manual

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).

Visit our homepage (www.autonics.com) to download manuals

Cautions during Use

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

Follow instructions in Cautions during Use. Otherwise, it may cause unexpected accordents. 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 thermocouple (CT) temperature sensor, use the designated compensation wire for extending wire. 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 inard time in the sensor.

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

 10. Install a surge absorber at each end of inductive load coll when controlling high-capacity power relay of inductive load (c.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')

 ③Pollution degree 2

Major Products

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Area Sensors Proximity Sensors Pressure Sensors Rotary Encoders Connector/Sockets	Timers Panel Meters Tachometer/Pulse (Rate) Meters Display Units Sensor Controllers	Autoni
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