

Please read this document carefully before using this product. The guarantee will be invalidated if the device is damaged by not following instructions detailed in the manual. The company shall not be responsible for any damage or losses however caused, which may be experienced as a result of the installation or use of this product.

35x77mm Sized

ENDA EMTC2412 MILK TANK CONTROLLER

Thank you for choosing ENDA EMTC2412 Milk Tank Controller.



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	On-Of	f Contr	1

- Two relay output can be selected for cooling and agitating.
- Single NTC prob input. Compressor protection parameters can be set.
- In case of probe failure, input status can be set to ON, OFF or periodic.
- Upper and lower setpoint limits can be adjusted.
- Agitation ON and OFF duration can be adjusted.
- Lower and upper alarm limit can be adjusted to depending on set value.
- °F or °C Temperature unit selection.
- External alarm function can be configured to digital inputs.
- Transfer device parameter settings with ENDA key - no power-up required. (Optional)
- RS485 ModBus protocol communication feature. (Optional).

accessible by the operator.

CE marked according to European Norms.

R_NHS **CF Compliant**



50/60Hz 5VA

Order Code :

EMTC2412 -

1 - Supply Voltage

230.....230V AC

10-30V DC /

8-24VAC

ENDA EMTC2412 is intended for installation in control panels. Make sure that the device is used only for intended purpose. The electrical connections must be carried out by a qualified staff and must be according to the relevant locally applicable regulations. During an installation, all of the cables that are connected to the device must be free of electrical power. Device must be protected against inadmissible humidity, vibrations, severe soiling and make sure that the operation temperature is not exceeded. The cables should not be close to the power cables or components.

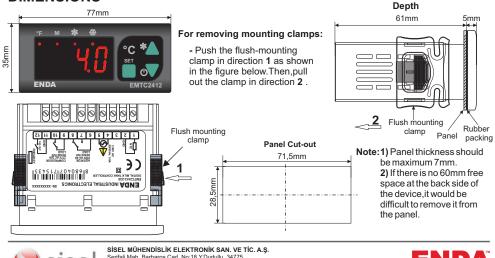
	ent is protected	EMITC2412-230 DIGITAL MILK TANK CONTRU CCC UNANK CONTRU- Strank UNANK CONTRU- STRANK UNANK	ALL ELECTRONICS	ESSOR	
NOTE: <u>SUPPLY:</u> 184-253V AC (veya 10-30V DC / 8-24V AC	4 ← Line 5 ← Neut	Fuse F 100 mA 250V AC	Switch	 Note: 1) Mains supply cords shall meet the IEC 60227 or IEC 60245. 2) In accordance with the safety regusupply switch shall bring the identirelevant instrument and it should be according to the same set of the same set. 	ulations, the pov ification of the

be connected Cable size: 1,5mm²

Ambient / Storage temp. 0 ... +50°C/-25 ... 70°C (without icing) Relative humidity 80% for temperatures up to 31°C decreasing linearly to Relative humidity 50% relative humidity at 40°C. Protection class According to EN60529; Front panel: IP65 Height Max. 2000m Do not use the device in locations subject to corrosive and flammable gasses. ELECTRICAL CHARACTERISTICS Supply voltage 230V AC +%10-%20, 50/60Hz ;10-30V DC / 8-24V AC SMPS Power consumption Max. 5VA Connection Scale 2.5mm² screw-terminal connections -60.0 ... +150.0°C (-76.0 ... +302.0°F) Sensitivity 0.1°C (Can be selected as 0.1°C or 1°C.) Accuracy ±1°C ±1% Time accuracy Display 4 digits, 12,5mm, 7 segment LED EN 61326-1: 2013 EMC EN 61010-1: 2010 (Pollution degree 2, overvoltage category II) Safety requirements OUTPUTS Kompresör rölesi için: NO 277V AC,20A (rezistif yük için), 2hp 250V AC (endüktif yük için) Relay Output NO/NC 250V AC,8A (rezistif yük için), Karıştırıcı rölesi için: 1/2hp 250V AC (endüktif yük için) Kompresör rölesi için: Yüksüz 10.000.000 anahtarlama; 277V AC,20A (rezistif yük için) 100.000 anahtarlama Life expectancy for Relay Karıstırıcı rölesi icin: Yüksüz 30.000.000 anahtarlama: 250V AC, 8A rezistif yükte 100.000 anahtarlama. CONTROL Control type Single set-point control Control algorithm On-Off control Hysteresis Adjustable between 1 ... 20.0°C HOUSING Suitable for flush -panel mounting Housing type Dimensions W77xH35xD61mm Weight Approx. 190g (After packing) Enclosure material Self extinguishing plastics. While cleaning the device, solvents (thinner, gasoline, acid etc.) or corrosive materials must not be used.

DIMENSIONS

ENVIRONMENTAL CONDITIONS







requirements of

lations, the power

2) During a pa	arameter value is indicated or measured temperature value in °F unit, this LED is ON. arameter value set in the hidden menu and if the current parameter is also available this LED is ON.
	D : 1) If agitator operation type is dependent to compressor, this LED is ON.
AGITATOR LED : 1) If agitator out	 If agitator operation type is in automatic mode (flasher timing), this LED is OFF. put activated, this LED is ON. agitator delays, this LED blinks.
	ressor output activated, this LED is ON.
2) While w	vaiting compressor delays, this LED blinks.
In running mode , indicate	is the set value. dicates the selected parameter value.
	bows to pass to the next parameter. While setting a parameter, increase the held down continuously, parameter value increases rapidly.
	ows to pass to the previous parameter. While setting a parameter, increase key held down continuously, parameter value decreases rapidly.
· ·	
FRONT PANEL COMMANDS 1. Viewing and Changing The Set Value	
While in the running mode, if key is pressed set value is displayed for 3 seconds. While	e in this case,the set value is changed with 🚺 keys.
2. Locking and Unlocking Keys	
Measurement set _ Loc Keys are locked.	
-240 Value Keys are unlocked.	
While in the operating mode, if \overleftarrow{l} keys are pressed together among 2 seconds the $L \Box c$ m	essage is displayed and the keys are locked. If the keys are locked
While keypad locked, if the pressed for 2 seconds again un L message is displayed and key lock is opened. While keypad locked, if the key is pressed, set value can be displayed but set value can not be can be displayed but set value can not be can be displayed but set value can	d and is returned to the normal way of working. While keys are locked, shanged. While keypad locked, if any key is pressed except and the set of the set of the set of the set of the set
message appears on display.	
3. Manuel Agitating Process In "Running Mode", if A key is pressed for 2 seconds, agitating process starts or stops. If RD	an normator is 0, manual exitating is disabled
4. Activating / Inactivating The Control Outputs	
A control ouput becomes inactive.	
When in the running mode, if ∇ key is pressed for 2 seconds, <i>L.d.</i> J message is displayed	and control outputs becomes to the inactive position, the device works as
the indicator. When the control outputs are disabled; if ∇ key is pressed for 2 seconds, <i>L</i> . <i>B</i> is the sage is displayed the indicator.	
5. Changing Parameter Values	
Keys are pressed together for 2 seconds P <i>i</i> is displayed and the user menu is entere	
While a parameter was selected, by pressing to water a parameter's value is displayed, parameter name is shown, no action is done after 3 seconds or to the key is pressing	the displayed this parameter can be changed with A keys. When the gagain to return to the parameter's name. When the parameter name is
shown, The keys are pressed together immediately without waiting to get out of this proc	
6. The Hidden Menu	
While in the user menu, if ∇ key is pressed for 7 seconds the $P2$ mess	
Then	
this menu. 7. Transferring the parameters between menus	
If keys are pressed together for 2 seconds, parameter is transfe	rred to the user menu. In this way, up to 8
parameters can be transferred to the user menu . In user menu, if the transferred to the user menu . In user menu, if the transferred to the user menu .	the parameter is removed from the user menu.
When a parameter is displayed in the user menu °F LED lights up in the parameter, <i>nP</i> message is displayed.	hidden menu. If the user menu have not any
	L.r 03
ERROR MESSAGES	
PFR Thermostat probe is broken.	
Temperature value is higher than the scale.	Temperature value is lower than the scale.
ALARM SITUATION	
1) If an alarm condition occurs, measurement parameter value flashes on indic	zator.
<i>ER</i> 2) External alarm is activated. Outputs are not affected by this condition.	
2) External alarm is activated. Outputs are not affected by this condition.	
2) External alarm is activated. Outputs are not affected by this condition.	
2) External alarm is activated. Outputs are not affected by this condition.	store the factory parameters.

MANUEL RUNNING MODE :

RUNNING MODES

If environment temperature is above the 5EE (setpoint) and REEP parameter is selected as $\bar{\rho}R\rho$, compressor and agitating relays become activated. When the environment temperature drops below the set value, the compressor relay is deactivated. After the compressor deactivated, agitator relay remains active until RLon time. After this time, agitator period deactivated until BLoF time. After this time agitator becomes active again.

AUTOMATIC RUNNING MODE :

If RLLP parameter is set to pto, agitator relay runs independently from the compressor relay until RLop and /or deactivated until RLoF period.

ENDAKEY PARAMETER TRANSFER

TRANSFERRING THE PARAMETERS FROM ENDAKEY TO DEVICE



While in "Running Mode", if vevo n device or "Read" button on "ENDAKEY" is pressed, "dL" message appears on display and parameters are read and transferred to the device. If the parameter transfer is successful, the " r EF " message appears and the device begins to work with the loaded parameter values. If the parameters are wrong, incorrect or " ENDAKEY " is faulty, \mathcal{Err} " message appears. Parameters will not be changed on device.

TRANSFERRING THE PARAMETERS FROM DEVICE TO ENDAKEY

While in "Running Mode", if 📥 key is pressed on device, "uL" message appears on display and parameters are read and transferred to the device. If process succes, " Suc " message appears. In case of failure, " Err" message appears. Parameters will not be changed on device.

NOTE 1 : No power-up required for transfering the parameter by using "ENDAKEY". For long battery life, "ENDAKEY" must be disconnected from device after the transferring process. **NOTE 2 :** Please specify at order "ENDAKEY" if required.

DEVICE PARAMETERS

CONTR	DEVICE PARAMETERS	1			
	OL PARAMETERS	MIN.	MAX.	UNIT	DEF. SET
SEE uPL	Setpoint value. Upper limit for setpoint value.	-60.0	150.0	°C	2.0
Lol		-60.0	<u>PL</u> 150.0	0°C	150.0 -60.0
195 195	Lower limit for setpoint value. Cooling hysteresis.	LoL	20.0	°C	- 8 0.0 2.0
oFF	Cooling offset value.		20.0	0°	Ω
-	6	- 2 0.0	C U.U		U
	URATION PARAMETERS			1	
Unit	Temperature unit (Devices with part code suffix 'F' have deg F as the default 'Unit').	°C	°F		°C
dPnŁ	Decimal point ($n a$ = decimal point isn't shown 22°C, \Im E 5=decimal point is shown 22.3°C.)	00	<i>9</i> 85		no
d. inP	Digital input types. σd :Digital input unused. \mathcal{ER} : External alarm. \mathcal{ER} message flashes in the display. Output unchanged. \mathcal{SR} : Important external alarm. \mathcal{SR} message flashes in the display. Relay output is turned off. \mathcal{HL} : Control type. \mathcal{LEYP} parameter is changed.(If $\mathcal{HE} = \mathcal{Lo}$, If $\mathcal{Lo} = \mathcal{HE}$) \mathcal{dF} : Defrost operation is started.	nd	dF		nd
dd i	Digital input delay. The period of the digital inputs to be active.	0:00	99:00		0:00
dPo	Digital input polarity. cL = While a digital input contact is closed,it is activated. oP = While a digital input is opened, it is activated.	ΕL	٥P		ĒL
COMPR	ESSOR PROTECTION PARAMETERS		1	1	
[.Pon	Delay time for the compressor after power is on.	0:00	99:00	min:sec	1:00
[.FoS	Required delay time for the compressor to restart following stop.	0:00	99:00	min:sec	1:00
C.PPn	ON time period for the compressor output in case of probe failure.	0:00	99:00	min:sec	0:00
[.PPF	OFF time period for the compressor output in case of probe failure.	0:00	99:00	min:sec	1:00
AGITATO	OR CONTROL PARAMETERS				
Я <u>С.</u> Е Р	Agitator run type selection. after: Agitator runs dependent to compressor. at a: Runs independently from compressor, runs according to RLan and RLaF	coñP	צ יהפ		coñP
RG.on	Agitator uptime duration. (If RLon is selected as 0, automatic and manual agitating is disabled).	0:00	99:00	min:sec	3:00
RG.oF	Time intervals between two successive agitators.	0:00	99:00	hr:min	00: IS
8 <u>6</u> .Pn	Agitating process by power-up. General Science Scien	00	985		00
RG.Po	Agitating process delay time after power-up.	0:00	99:00	min:sec	I:00
ALARM	CONTROL PARAMETERS				
RuPL	Limit for upper alarm level. When $RLYP$ is changed, $R_{u}PL$ should be readjusted.	RLoL	150.0	°C	<i>ISO</i>
RLoL	Limit for lower alarm level. When RLYP is changed, RLoL should be readjusted.	- 60.0	R.JPL	°C	-60
RHYS	Hysteresis alarm	D. 1	20.0	°C	2
Я.Е УР	Alarm configuration. ($Rb5 =$ Independent alarm. Alarm values are $RLoL$ and $R \cup PL$.) ($r EF =$ Relative alarm. Alarm values are $5EF - RLoL$ and $5EF + R \cup PL$.) NOTE: Upper and Lower alarm level variables are determined according to the " $REYP$ " parameter. If $REYP = Rb5$, $RLoL$ and $R \cup PL$. If $REYP = rEF$, $LoL = 5EF - RLoL$ and $R \cup PL$.	ЯЬЅ	rEF		<i>R</i> ЬS
R.JFL	Time delay to display alarm message after alarm is on.	0:00	99:00	min:sec	0:00
RdPo	Time delay to display alarm message after power is on.	0:00	99:00	hr:min	0: 10





Holding		EGIST	ERS			
Holding Register Addresses Data Decimal Hex Type			Data Content	Parameter Name	Read/Write Permission	
	Hex					
0000d	0x0000		Set value.	565	Read / Write	
0001d 0002d	0x0001 0x0002		Set point upper limit. Jpper level alarm.		Read / Write	
			Set point lower limit.	R.uPL	Read / Write	
0003d 0004d	0x0003 0x0004			LoL		
00040 0005d	0x0004 0x0005		Lower level alarm.	R.L.o.L	Read / Write Read / Write	
0005d	0x0005		Cooling hysteresis.	6FF	Read / Write	
0007d	0x0000 0x0007		Alarm hysteresis.		Read / Write	
0008d	0x0007 0x0008		Digital input types. $0=nd$; $1=ER$; $2=5R$; $3=HE$; $4=dF$		Read / Write	
0009d	0x0008		Dijital input delay time.	d. inP	Read / Write	
				dd i	Reau / White	
0010d	0x000A	word	Delay time for the compressor after power-up.	E.Pon	Read / Write	
0011d	0x000B	word	Required delay time for the compressor to restart following stop.	E.Fos	Read / Write	
0012d	0x000C	word	ON time period for the compressor output in case of probe failure.	E.PPn	Read / Write	
0013d	0x000D	word	OFF time period for the compressor output in case of probe failure.	C.PPF	Read / Write	
0014d	0x000E	word	Agitator uptime duration. (If $R_{L_{\alpha}\alpha}$ is selected as 0, automatic and manual agitating is disabled).	AC.on	Read / Write	
0015d	0x000F	word	Time intervals between two successive agitators.	AC.oF	Read / Write	
0016d	0x0010	word	Agitating process delay time after power-up.	AC.Po	Read / Write	
0017d	0x0011	word	Time delay to display alarm message after alarm is ON.	R.dFL	Read / Write	
0018d	0x0012	word	Time delay to display alarm message after power is ON.	R.dPo	Read / Write	
0019d	0x0013	word [Device address for RS485 network connection.Adjustable between 1-247.	Rdr 5	Read / Write	
0020d	0x0014	word I	Baudrate (0=Off; 1=1200, 2=2400, 3=4800, 4=9600, 5=19200)	ЬЯud	Read / Write	
1.2 INP	UT REGI	STERS				
	ng Register dresses	Data Type	Data Content	Parameter Name	Read/Write Permission	
Decima	l Hex	Type		Name		
0000d	0x0000	word	Measured temperature value (°C / °F)		Read	
* Input F	Register par	ameter v	alue of the temperature reading,is defined as a signed integer. This value is asso	at a family stills in the setting		
	°C"value of		ure "235" will be read in.)	clated with a portion	1.	
So,"23,5		temperat	ure "235" will be read in.)		ı.	
So,"23,5 I .3 DIS	°C"value of CRETE I g Register	temperat	ure "235" will be read in.)			
So,"23,5 I.3 DIS Holdin	CRETE I	temperat	ure "235" will be read in.) Data Content	Parameter Name	n. Read/Write Permission	
So,"23,5 I.3 DIS Holdin	CRETE I g Register Iresses	temperat	ure "235" will be read in.) Data Content	Parameter	Read/Write	
So,"23,5 I.3 DIS Holdin Add	CRETE I g Register Iresses	temperat	ure "235" will be read in.) Data Content	Parameter	Read/Write	
(So, "23,5 1.3 DIS Holdin Adc Decimal 0000d 0001d	CRETE I g Register tresses I Hex 0x00 0x01	temperat	ure "235" will be read in.) Data Content Compressor output status (0=OFF; 1=ON)	Parameter Name	Read/Write Permission	
So,"23,5 1.3 DIS Holdin Adc Decimal 0000d 0001d	CRETE I g Register tresses I Hex 0x00 0x01	temperat NPUTS Data Type Bit	Data Content Compressor output status (0=OFF; 1=ON)	Parameter Name	Read/Write Permission Read	
So,"23,5 1.3 DIS Holdin Adc Decima 0000d 0001d 1.4 COI	CRETE I g Register lresses I Hex 0x00 0x01 ILS Coil	temperat NPUTS Data Type Bit	ure "235" will be read in.) Data Content Compressor output status (0=OFF; 1=ON) Agitator output status (0=OFF; 1=ON)	Parameter Name	Read/Write Permission Read Read	
So,"23,5 I.3 DIS Holdin Adc Decimal 0000d 0001d I.4 COI C Add	CRETE I g Register fresses Hex 0x00 0x01 LS Coil resses	temperat NPUTS Data Type Bit Bit	Data Content Data Content Compressor output status (0=OFF; 1=ON) Agitator output status (0=OFF; 1=ON) Data Content	Parameter Name	Read/Write Permission Read	
So,"23,5 I.3 DIS Holdin Adc Decimal 0000d 0001d I.4 COI C Add	CRETE I g Register fresses Hex 0x00 0x01 LS Coil resses	temperat NPUTS Data Type Bit Bit Data	Data Content Data Content Compressor output status (0=OFF; 1=ON) Agitator output status (0=OFF; 1=ON) Data Content	Parameter Name Parameter	Read/Write Permission Read Read Read/Write Permission	
So,"23,5 I.3 DIS Holdin Adc Decima 0000d 0001d I.4 COI C Add Decimal	CRETE II g Register Iresses I Hex 0x00 0x01 ILS Coil resses Hex	temperat NPUTS Data Type Bit Bit Data Type	Data Content Data Content Compressor output status (0=OFF; 1=ON) Agitator output status (0=OFF; 1=ON) Data Content	Parameter Name Parameter Name	Read/Write Permission Read Read Read/Write Permission Read / Write	
So,"23,5 I.3 DIS Holdin Adc Decimal 0000d 0001d I.4 COI C Add Decimal 00d	CRETE I g Register fresses I Hex 0x00 0x01 ILS Coil resses Hex 0x00	temperat NPUTS Data Type Bit Bit Data Type Bit	ure "235" will be read in.) Data Content Compressor output status (0=OFF; 1=ON) Agitator output status (0=OFF; 1=ON) Data Content Data Content Data Content Temperature unit. OFF= ^a [ON= ^a F	Parameter Name Parameter Name Un 12	Read/Write Permission Read Read	
So,"23,5 1.3 DIS Holdin Adc Decimal 0000d 0001d 1.4 COI 0001 1.4 COI 0001 0001 0001 0001 0001 0001 0001 0001 0001 0001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00001 00000 00001 00000 00001 00000 00001 00000 00001 00000 00001 00000 00001 00000 00001 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 0000 00000 00000 00000 00000 00000 00000 00000 00000 00000 0000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 0000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 000000 000000 0000000000	CRETE I g Register fresses I Hex 0x00 0x01 ILS Coil resses Hex 0x00 0x00	temperat NPUTS Data Type Bit Bit Bit Bit	ure "235" will be read in.) Data Content Data Content Compressor output status (0=OFF; 1=ON) Agitator output status (0=OFF; 1=ON) Data Content Data Content Data Content Decimal point . OFF=□□ ON=𝔅𝔅 ๖ Decimal point . OFF=□□ ON=𝔅𝔅 ๖	Parameter Name Parameter Name Un 12 Un 12	Read/Write Permission Read Read/Write Permission Read / Write Read / Write	
So,"23,5 I.3 DIS Holdin Adc Decima 0000d 0001d I.4 COI C Add Decimal 00d 01d 01d 02d	CRETE II g Register Iresses I Hex 0x00 0x01 LS Coil resses Hex 0x00 0x01 0x01	temperat NPUTS Data Type Bit Bit Bit Bit Bit Bit	ure "235" will be read in.) Data Content Data Content Compressor output status (0=OFF; 1=ON) Agitator output status (0=OFF; 1=ON) Data Content Data Content Data Content Decimal point . OFF= aa ON= $4baa$ Decimal point . OFF= aa ON= $4baa$ Digital input polarity. OFF= cL ON= a^p	Parameter Name Parameter Name Un :L d.PnL dPo	Read/Write Permission Read Read Read/Write Permission Read / Write Read / Write Read / Write	

