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controllers & more

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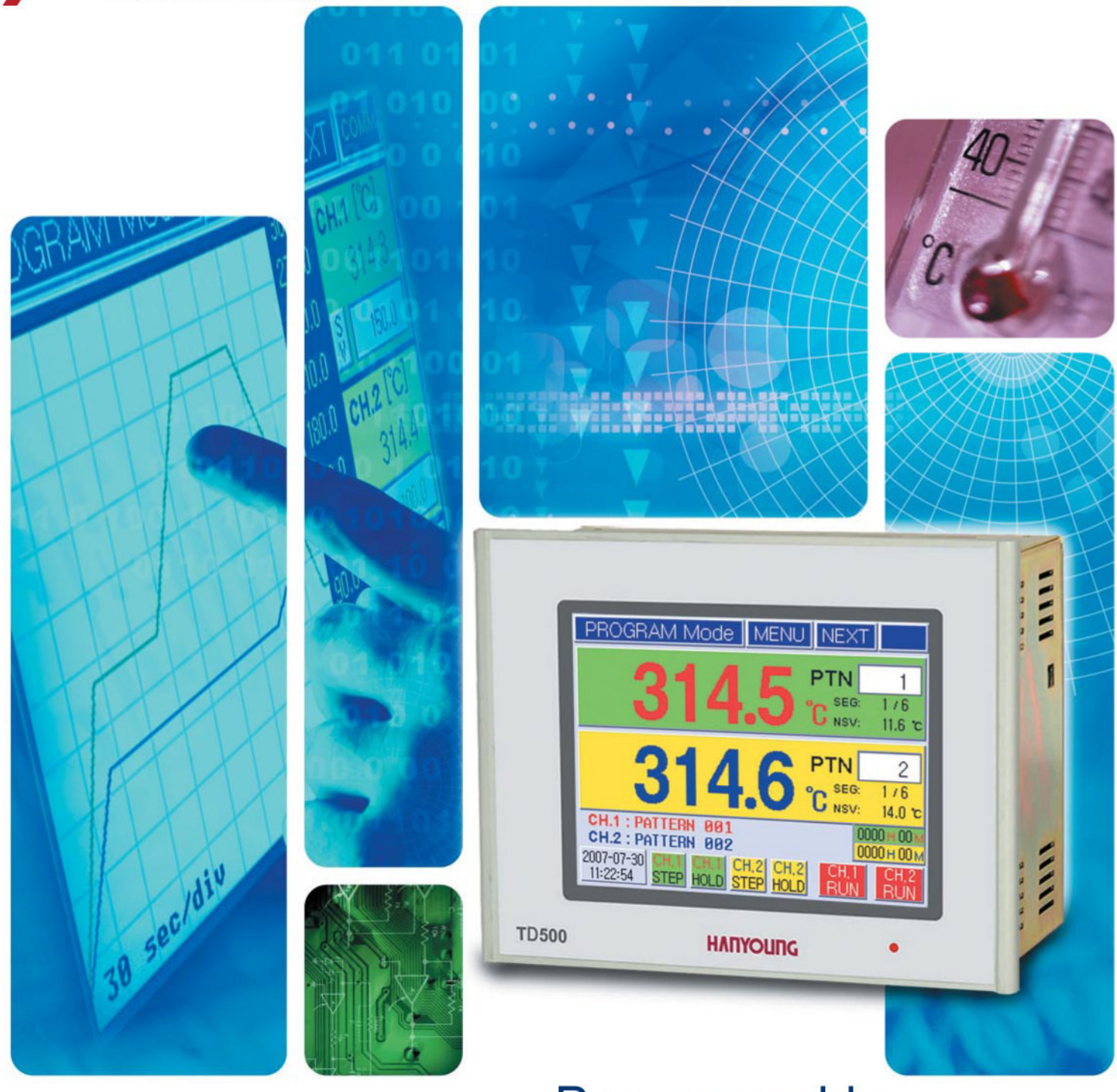


Programmable
Temperature Controller
TD500

Distribuidor Master HANYOUNG NUX

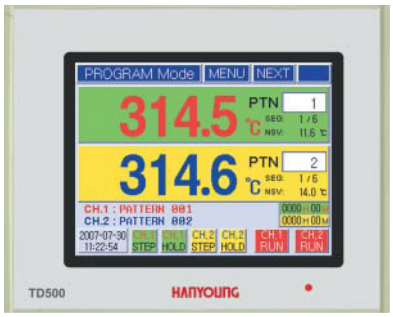
Programmable
Temperature Controller

Hanyoung Nux's TD500 programmable temperature controller is composed as a 2channel (Loop), allowing the control of each of the two devices with 1 controller. Color LCD and touch-screen for easy usage.
Furthermore, TD500 is consist of ±0.1 % indication accuracy, sampling period of 500ms, 100 Segment / Pattern, total of 2400 segments, 4 points of alarm, 8 points of time signals, 8 points of contact input D.I.

1 2-Channel Programmable Temperature Controller

Model TD500 is generally built for 2channel control, but in the use of a single channel, just one screen can be used as an indicator. Furthermore, the operation screen can be selected according to the need of the 3 types of the 1st operation screen, the 2nd operation screen and the 3rd operation screen.

The 1st Operation screen (1 channel Mode)



The 1st Operation screen (2 channel Mode)

2 Group PID Group (4 Zone)

The PID GAIN for this instrument is divided into 4 group for each channel. The optimal PID GAIN can be applied for control.

P.I.D setting screen

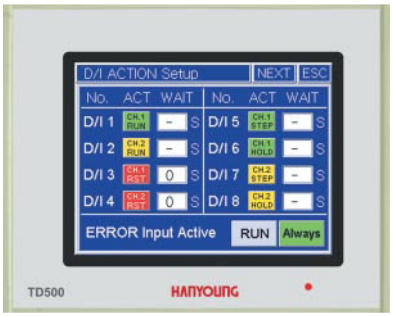
3 Time Signal Output

The operation mode of the Time Signal is divided to 'segment ON / OFF' or 'time operated mode'. Total of 8 time signals can be set.

Time signal setting screen

4 Contact Input (D.I)

Contact input (D.I) has a total of 8 points, modes that can be switched from RUN, RST, STEP, and HOLD.



contact input setting screen

contact input name display screen

2 Channels Programmable Temperature Controller

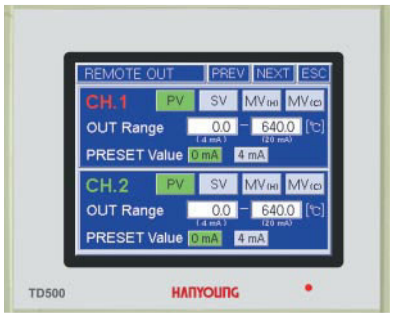
5 Program Pattern

The pattern is 100 patterns, with set segments to 1 pattern per up to as many as 100 segments, with a total of 2400 segments.

Program pattern setting screen

6 Retransmission Output

A selected item can be used as 4 – 20 mA d.c. retransmission output in the 4 types of item for each channel.



Retransmission output setting screen

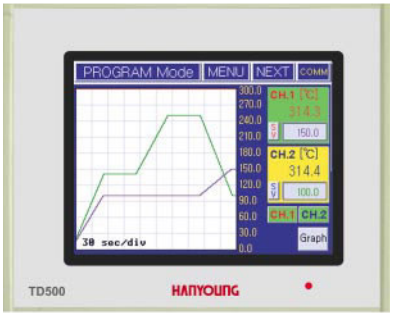
7 Heating/Cooling Control

The heating or cooling control can be selected between control modes by each channel.

Control output setting screen

8 Other Display Screen

The 2nd operation screen (Signal status screen)

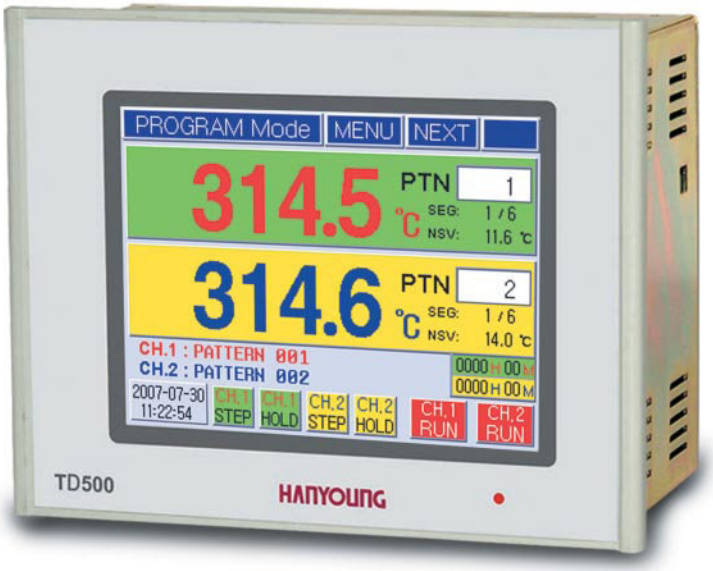


The 3rd operation screen (Graph display screen)

Alarm code select screen

FEATURES

- Touch screen color LCD screen
- 4 P.I.D zone
- Universal Input
- Time signal 8 points
- Alarm output 4 points
- Heating / Cooling control output
- Contact input(D.I) 8 points/ Contact output(D.O) 16 points
- Communication function



2 Channels Programmable Temperature Controller

SPECIFICATION

Display

Screen : Color LCD (115.17×86.37mm), 320X240 Pixel
Dimension : 144(H)×183(W)×103(D)
Back light : CCFL (50,000 hrs.)
Touch type : 4 wire resistive touch screen
Language : Korean, English
Display channel : 2 channel (1 channel or 2 channels selectable)

Input

Number of channel	2
Accuracy	0.1% of Full Scale.
Sampling time	each channel 500 ms
Input impedance	T.C, DC voltage (mV) : 1 MΩ, DC voltage (V d.c) : 1 MΩ DC current : 250 Ω (External resister)
Effect of input signal resistance	Thermocouple : 0.4 ㎷/Ω
Effect of input resistance	R.T.D : 50 Ω max. / line (Resistance is equal between lines.)
Sensor driving current	R.T.D : 300 μA
Detection of input disconnection	Burn Out detectable
Allowable input voltage	DC voltage (mV d.c) : 5 V d.c DC voltage (V d.c) : 15 V d.c
Resolution of PV	24 Bit (Effective resolution : 9999.99)
Input Type	T.C, R.T.D, DC voltage, DC current(With attached external shunt resister)
Memory function	Setting and operation information (built in Flash and NVRAM)
Retransmission output	Current output (4 – 20 mA)
R.J.C accuracy	Max. ±1.5 ℃
Scaling range	-999.9 ~ 9999.9
Insulation resistance	Min. 20 MΩ, 500 V d.c (Between input terminal and ground)
Dielectric strength	2,500 V a.c, 50/60 Hz for 1 minute (Between input terminal and ground)

• Measuring range

Type	Input	Temperature range
Thermocouple	K	-200.0 ~ 1370.0 ℃, ± 0.1% of F.S, (*1)
	J	-200.0 ~ 1200.0 ℃, ± 0.1% of F.S, (*2)
	E	-200.0 ~ 1000.0 ℃, ± 0.1% of F.S, (*3)
	T	-200.0 ~ 400.0 ℃, ± 0.1% of F.S, (*4)
	R	0.0 ~ 1700.0 ℃, ± 0.15% of F.S
	S	0.0 ~ 1700.0 ℃, ± 0.15% of F.S
R.T.D	Pt100 Ω (DIN43760)	-200.0 ~ 640.0 ℃
DC voltage	mV d.c	0.0 ~ 100.0 mV or -10.0 ~ 20.0 mV, ± 0.1% of F.S
DC voltage	V d.c	0.0 ~ 10.0 V (signal input range settable) ± 0.1% of F.S
DC current	4 – 20 mA	Attach an external shunt resister (250 Ω)

(*1) : Below 0 ℃ : ± 0.2 % of F.S
(*2) : Below 0 ℃ : ± 0.2 % of F.S
(*3) : Below 0 ℃ : ± 0.2 % of F.S
(*4) : Below 0 ℃ : ± 0.2 % of F.S

Function

Setting pattern : Max 100 patterns
Setting segment : 100 segment / pattern (Total 2400 segments)
Segment time : 00h 00 m ~ 99h 59m / 99m59s (Selection by button on screen)
Pattern repetition : 1 ~ 999 times or endless repeat
Wait zone : ±0.1 ~ 999.9 Wait zone range
Wait time : 00h 00 m ~ 99h 59m
Time signal : Segment ON/OFF or Time setting mode
(00hr 00min ~ 99hr 59min / 99min 5959sec : According to segment time selection)
Pattern name setting : Indicate a pattern name in Korean / English
Start / Finish setting : Set a condition of start / finish for each channel.
Start mode(SSV / PV1 / PV2), Start setting value,
Finish mode (RST / HOLD), End segment.
Pattern / segment management : Copy or initialize an original pattern and segment.
Time signal setting point : Max. 8 points
Inner signal setting : Set a object, type, range, direction, delay time.
Graph setting : Indicate a measuring value as graph and set a size of X axis and Y axis.
Ramp function : Select a variation rate of setting value in Fix operation.
Screen protection function : Set a time for automatic OFF for LCD screen. (Max. 99m)
Event log : Save an event information (Max. 40 event)
Operating time reservation : Reserve an operation start time in year, month, day, hour and minute.
Fix control time setting (Fix run mode) : Set a operating time for fix control. (Max. 9999h 59m)
Language selection : Select a language on the menu. (Korean / English)

SPECIFICATION

Control Mode

Control mode	2 Loop
Control computing function	a) P.I.D operation Auto tuning(Reverse,Direct action selection)
	b) ON/OFF,P,PI,PID operation selection
	c) Heating / Cooling P.I.D Auto tuning
Proportional band	0.0 ~ 1000.0 ℃ ("0"is ON / OFF control)
Integral time	0 ~ 6000 sec.
Derivetive time	0 ~ 6000 sec.
ON/OFF control hysteresis	0.1 ~ 1000.0 ℃
Cycle time	1 ~ 1000 sec.
A.R.W(Anti reset windup)	50 ~ 200 % of P band
Manipulated value	-5.0 ~ 105.0 %
MV tracking	ON / OFF, MV change rate limit function (10 % / sec)
P.I.D Zone	4 groups (Level P.I.D)

•Control output

Channel 1 & Channel 2	Current output S.C.R	Output point : Heating / Cooling control output
		Output signal : 4 – 20 mA d.c
		Resistive load : Max. 600 Ω
		Accuracy : ±0.1 % of Full span
		Temperature drift : ±200 ppm/℃ (Output part)
Channel 1 & Channel 2	Voltage pulse output S.S.R	Output point : Heating / Cooling control
		Output signal : ON voltage 24 V d.c
		Resistive load : Min. 600 Ω
		Minimum pulse width : 10ms
Retransmission output	Selection of output type	PV, SV, MV for heating / MV for cooling selection
	Current output	4 – 20 mA d.c (By scale setting)
	Output resolution	16 bits
	Range of retransmission output	Scaling range setting
	Accuracy	± 0.1 % of Full span
	Retransmission disabled at heating / cooling control mode.	

•Alarm

Alarm setting	4 points
Type of alarm	High / Low deviation alarm etc (20 type of alarms)
Hysteresis	Setting value

•Contact output(D.O)

Contact output (D/O)	Output point	16 points (Relay : 8 points / Open collector : 8 points)
	Open collector	24 V d.c 300 mA Max. only resistive load
	Relay contact	N.O side 250 V a.c. 5 A or 30 V d.c. 5 A N.C side 250 V a.c. 2 A or 30 V d.c 1 A (only resistive load)

Contact Input(D/I)

Input point	8 points
Channel operation at a time (1channel / 2channel)	D/I-1(RUN/RST) D/I-2 ~ D/I-4(RST) D/I-5(STEP/RST) D/I-6(HOLD/RST) D/I-7(HOLD-ON/RST) D/I-8(HOLD-OFF)
Channel operation separately (1channel / 2channel)	D/I-1(CH.1 RUN/CH.1 RST/NONE/RST) D/I-2(CH.2 RUN/CH.2 RST/NONE/RST) D/I-3(CH.1 RST/CH.2 RST/NONE/RST) D/I-4(CH.1 RST/CH.2 RST/NONE/RST) D/I-5(CH.1 STEP/CH.1 RST/NONE/RST) D/I-6(CH.1 HOLD/CH.1 RST/NONE/RST) D/I-7(CH.2 STEP/CH.2 RST/NONE/RST) D/I-8(CH.2 HOLD/CH.2 RST/NONE/RST)
ERROR Input active	RUN / Always selection
Input signal	Non-volt contact input (ON : Max. 10 Ω, OFF : Min. 500 kΩ)

Communication

Standard	EIA-RS232C, EIA-RS422/485	
Max. connection lines	RS232	1 : 1
	RS422/485	1 : 256
Communication type	RS232	Full duplex
	RS422/485	4 lines / 2 lines half duplex
Synchronization	RS232 RS422/485	Asynchronous mode

Power

Voltage	100 – 240 V a.c. ±10 %
Variation rate	±10 % of voltage
Frequency	50 / 60 Hz
Power consumption	Main body approx. 16 VA I/O board approx. 20 VA
Insulation resistance	Between terminal and ground terminal min. 20 MΩ (500 V d.c)
Dielectric strength	Between power terminal and ground terminal 2500 V a.c. (50/60 Hz), for 1 min.

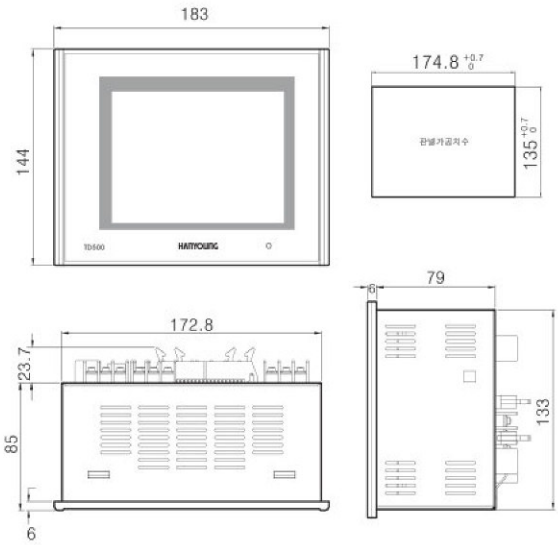
Operation Environment

Angle of installation	Max. 30 ° for back side direction, Horizontality for left and right
Ambient temperature	0 ~ 50 ℃
Ambient humidity	20 ~ 80 %RH
Vibration	10 – 60 Hz 0.2 m/s²
Shock	None
Weight	Approx. 2.35 kg (in packing condition)

● Ordering Information

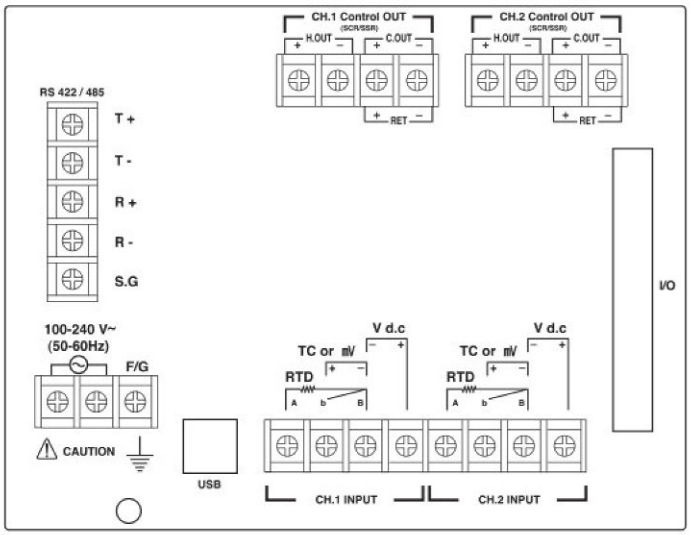
Model	Suffix code		Description
TD500	☐	☐	Programmable Temperature controller (2 channel)
Body	N		None
	1		Communication port RS422/485 + USB
	2		Communication port RS232 + USB
I/O board		N	None
		1	SMPS, relay output 8 points, transistor output 8 points, Contact input 8 points

● External Diagram and Panel Cutout (Unit : ㎜)

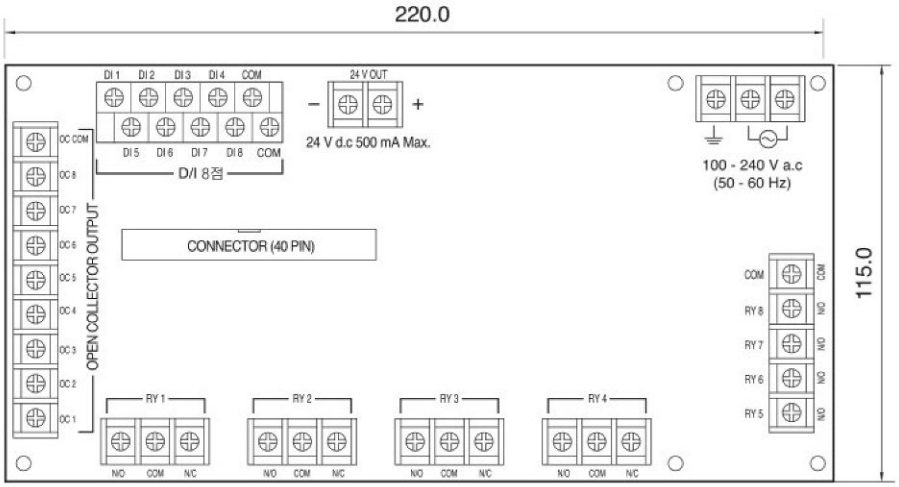


● Connection Diagram

• UNIT BODY



• I/O BOARD



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