

THERMOLATOR[®] HT & HTM Series

TW-HT Model -H0, -H1, -H2, -H3 and -H4

TW-HTM-1-HK



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Order-Data-sheet

Customer:

Customer's order No.: K US-PO00417/11 / 24.02.11 / Frances McBride

Acknowledgement No.: 72677 / 11

Number of unit.: 112071 / 112070

Description: Conair-temp.control unit
TW-HT models H0, H1, H2, H3, and H4
* 4 6 0 V / * 6 0 Hz
heating capacity: 12,0 kW
cooling capacity: 41800 W
circulating medium: water up to 392°F {200°C} max

special equipment installed or attached:

Art.-Nr. 54.50 voltage a/o frequency
* 4 6 0 V / * 6 0 Hz

Art.-Nr. 41.22 piston-operated diaphragm pump
for increasing the topping-up
pressure installed into the
plant is complete kit (14bar)
electrically controlled

Art.-Nr. 54.54 special paint:
RAL 7032 - housing
RAL 9005 - front door

Art.-Nr. 54.999 CONAIR private labelled:
- Conair graphics on controller
- Conair type plate with Conair
type designation and logo
- Conair sticker replaces
Single-sticker on front door

color / paint: RAL * 7032/9005
language: e n g l i s h
technical documentation: 1 x english
US-000444/11, Pos. 8 - 11

TECHNICAL SPECIFICATION

Conair - Pressurized temp. control unit with forced circulation

(gal. / PSI / hp indicated = US)

Equipment series:	TW-HT models H0, H1, H2, H3, and H4
Circulating medium:	Water up to 392°F {200° C} (max. system pressure 217.55 PSI/ 15 bar)
Heating capacity:	Refer to our quotation/order information
Cooling capacity:	Refer to our quotation/order information
Reference values for cooling capacity data:	
176° F {80° C} pre-run temperature	
59° F {15° C} cooling water temperature	
difference of pressure: cooling water inlet and outlet at least 43.51 PSI {3 bar}	

Equipment:

- Controller SC
- Level monitoring by magnetic-float-switch
- Flow monitoring by differential pressure observer
- Flow metering according to principle of pressure difference
- *Monitoring of surface temperature of heating rods via temperature sensor*
- *Safety temperature observer to process*
- Cooling by tubular-finned heat exchanger (Cu-Ni10Fe) in steel coat and solenoid valve
- Heating with Incolloy stainless steel tubular heaters
- Heating control by solid state relay (SSR)
- Dirt-trap in cooling water supply and in return line of circulating system
- Bypass between pressure- and return- line of small dimension
- separate automatic filling with dirt trap
- automatic temperature dependent system closing
- Piping and vessel stainless steel
- Electrical wiring to series terminal strips
- Control cabinet IP 54 fan-ventilated

Delivery:

- Unit on rollers and ready for connection

Magnetic-coupled pump	HT/CY 4281		
• Output rate max.	15.85	gal/min	60 l/min
• Pressure max.	87.02	PSI	6.0 bar
• Motor capacity	1.34	hp	1.0 kW

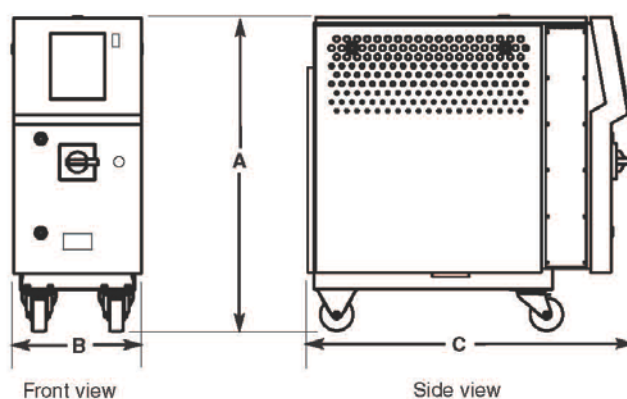
Connections:

- | | |
|----------------------|---|
| • Circulating medium | Sealing cone DIN 3863/3870 G 1/2"BSP AG |
| • Cooling water | Sealing cone DIN 3863/3870 G 3/8"BSP AG |
| • Filling | Sealing cone DIN 3863/3870 G 3/8"BSP AG |

- | | |
|----------------------------|--|
| • Dimensions L/W/H: | 755 mm x 315 mm x 765 mm (without connections) |
| • Weight (approx.) | 95 kg |
| • Color | case: RAL 7035 light grey |
| | front door: RAL 5014 pigeon blue |

- Technical changes reserved -

Specifications

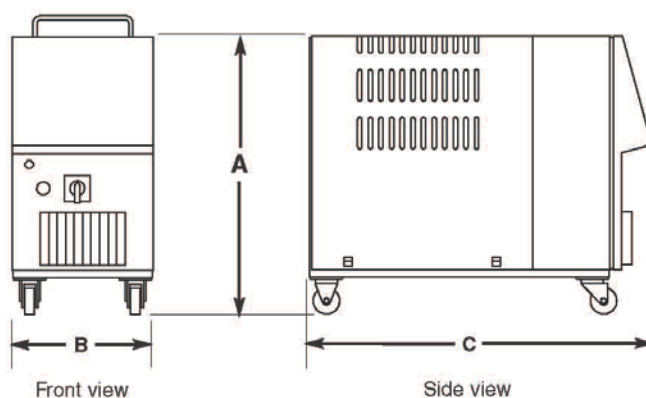


MODELS	TW-HT-H0	TW-HT-H1	TW-HT-H2	TW-HT-H3	TW-HT-H4
Performance characteristics					
Max. temperature range °F (°C)	392 (200)	392 (200)	392 (200)	392 (200)	392 (200)
Max. external volume gal (l)	2.38 (9)	2.91 (11)	9.25 (35)	47.29 (179)	83.48 (316)
Heating capacity heating circuit kW	6/9/12	6/9/12/18	24/36	36/48/60/72	36/72/96/108
Cooling capacity cooling circuit 176°F (80°C) flow and 59°F (15°C) cooling water cooling tons	8/12	8/12	12/20/33	33/66	33/66
Dimensions inches (mm)					
A - Height	30.12 (765)	37.21 (945)	53.15 (1350)	65.56 (1665)	83.08 (2110)
B - Width	12.41 (315)	13.59 (345)	19.88 (505)	21.66 (550)	32.68 (830)
C - Depth	30.91 (785)	39.18 (995)	53.74 (1365)	69.69 (1770)	76.38 (1940)
Connections NPT inches (female)					
Process fluid (water)	0.50	0.75	1.00	2.00	2.50
Cooling fluid	0.50	0.50	0.75	1.00	1.00
Fill	0.50	0.50	0.50	0.50	0.50
Pump performance					
Maximum flow rate gpm (l/min)	16 (60)	27 (100)	53 (200)	74 (280)	230 (870)
Maximum outlet pressure psi (bar)	88 (6.0)	117 (8.0)	117 (8.0)	61 (4.2)	61 (4.2)
Pump capacity Hp (kW)	1.5 (1.1)	3.8 (2.8)	5.4 (4.0)	5.4 (4.0)	10 (7.5)
Approximate weight lbs (kg)					
Installed	210 (95)	287 (130)	574 (260)	904 (410)	1764 (800)
Shipping	510 (231)	687 (312)	1099 (499)	1504 (682)	2489 (1129)

SPECIFICATION NOTE:

Specifications may change without notice. Consult a Conair representative for the most current information.

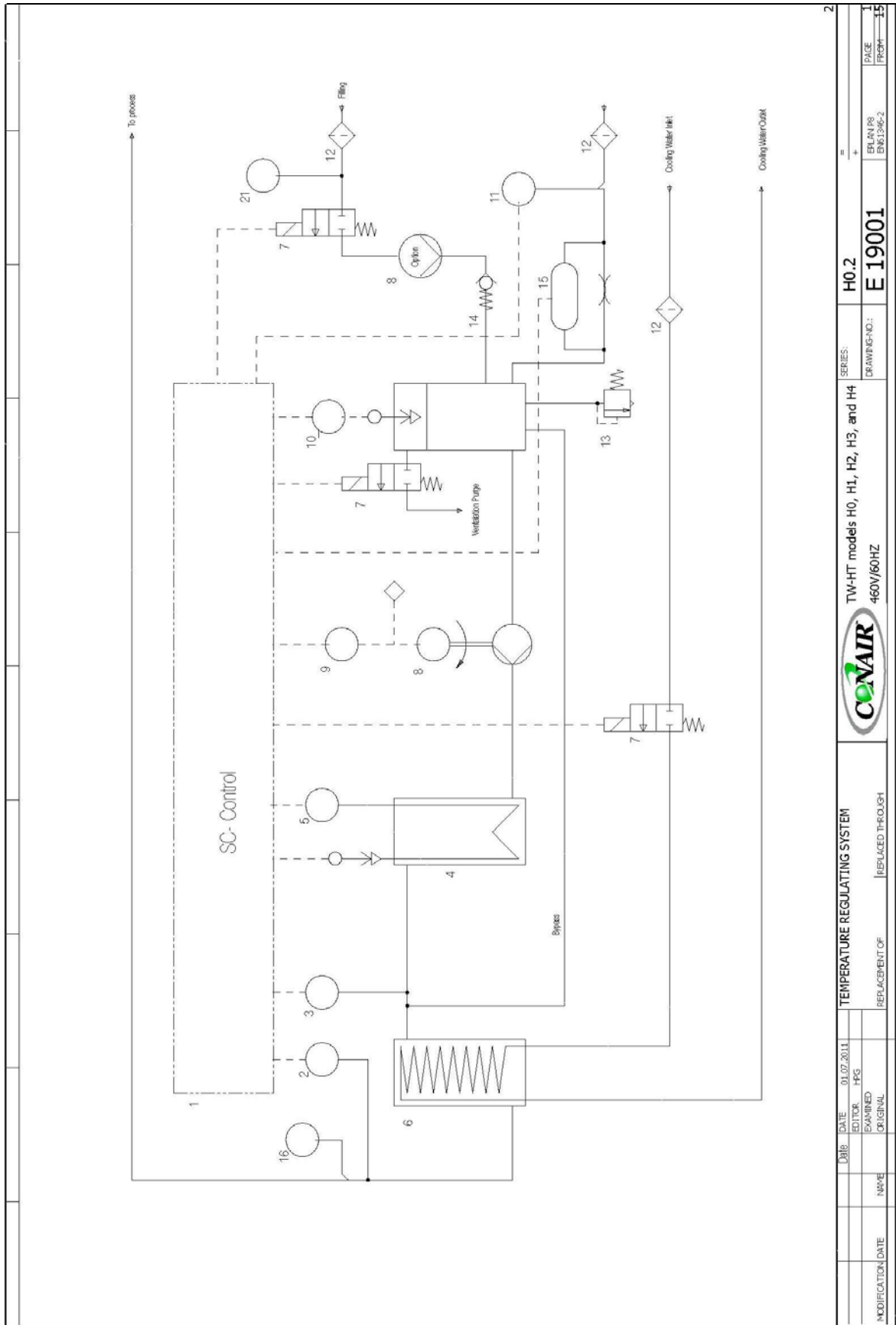
Specifications



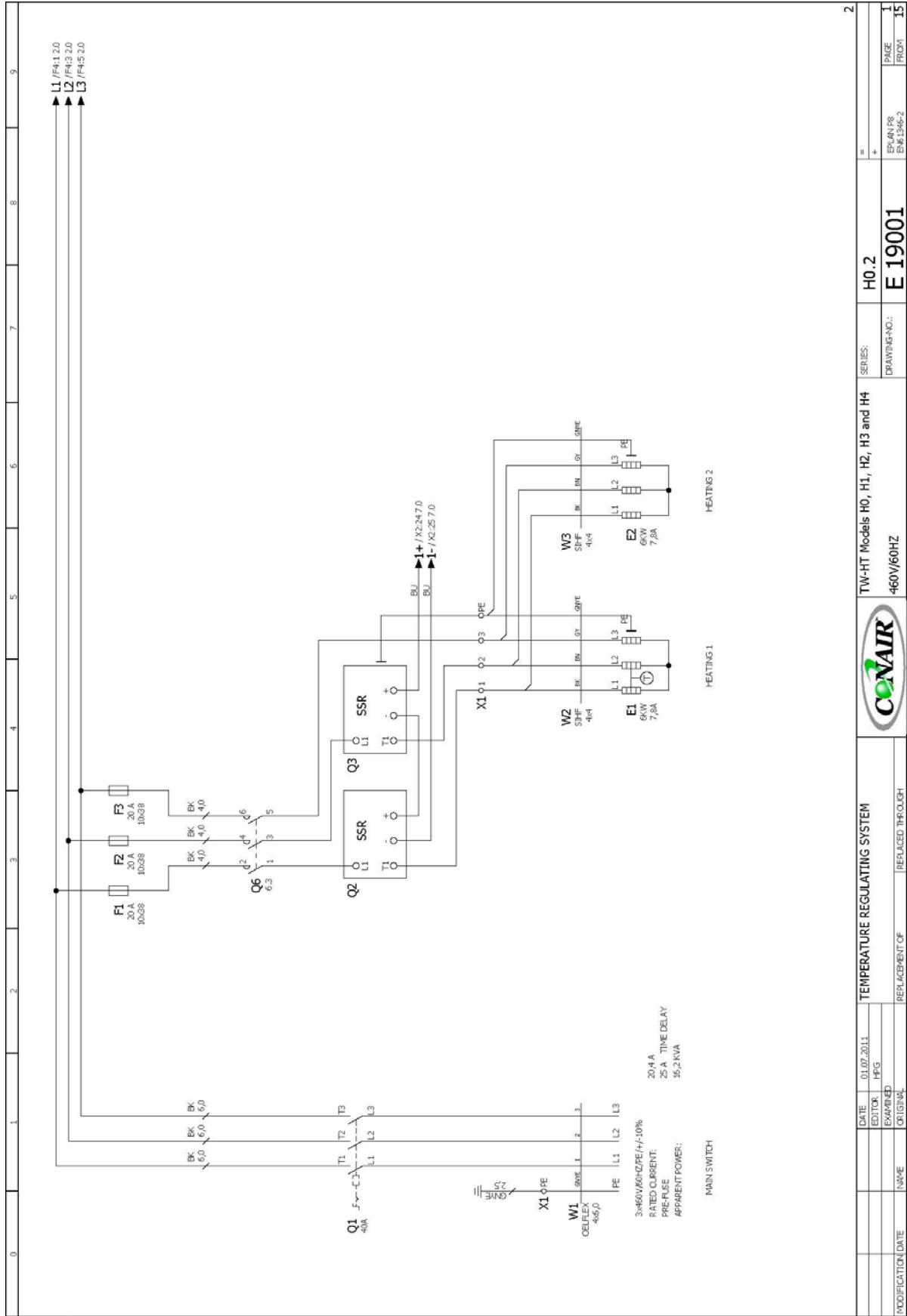
MODEL	TW-HTM-1-HK
Performance characteristics	
Maximum temperature range °F {°C}	437 {225}
Maximum external volume gal {l}	0.93 {3.5}
Heating capacity heating circuit kW	6
Cooling capacity cooling circuit 176°F {80°C} flow and 59°F {15°C} cooling water - cooling tons	1
Dimensions inches {mm}	
A - Height	20.67 {525}
B - Width	10.44 {265}
C - Depth	25.4 {645}
Connections NPT inches {female}	
Process fluid (water)	0.50
Cooling fluid	0.375
Filling	0.375
Pump performance	
Maximum flow rate gpm {l/min}	7 {25}
Max. outlet pressure (typical) psi {bar}	66 {4.5}
Pump capacity Hp {kW}	0.737 {0.55}
Weight lb {kg}	
Installed	287 {130}
Shipping	587 {266}

SPECIFICATION NOTES:

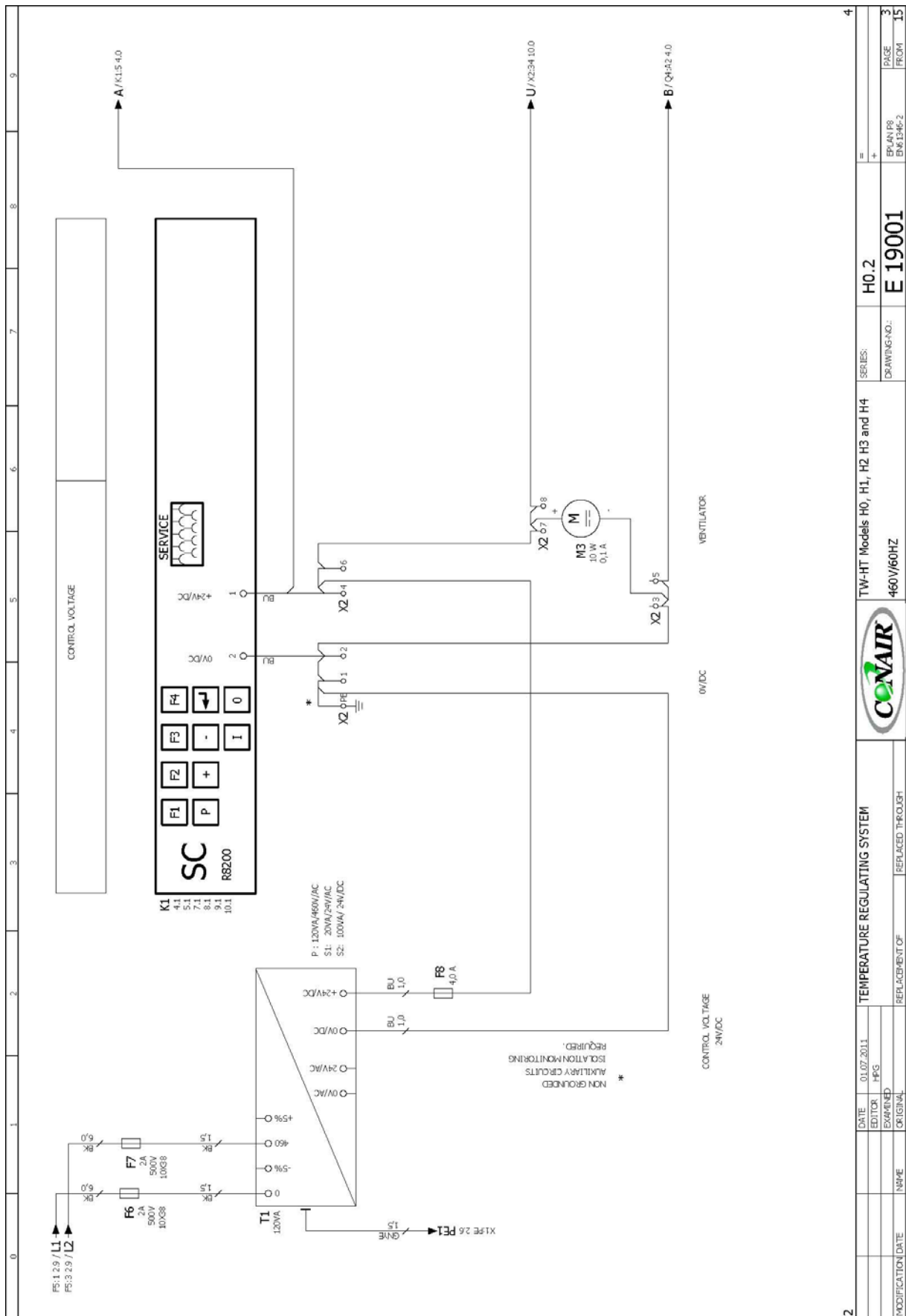
Specifications may change without notice. Consult a Conair representative for the most current information.

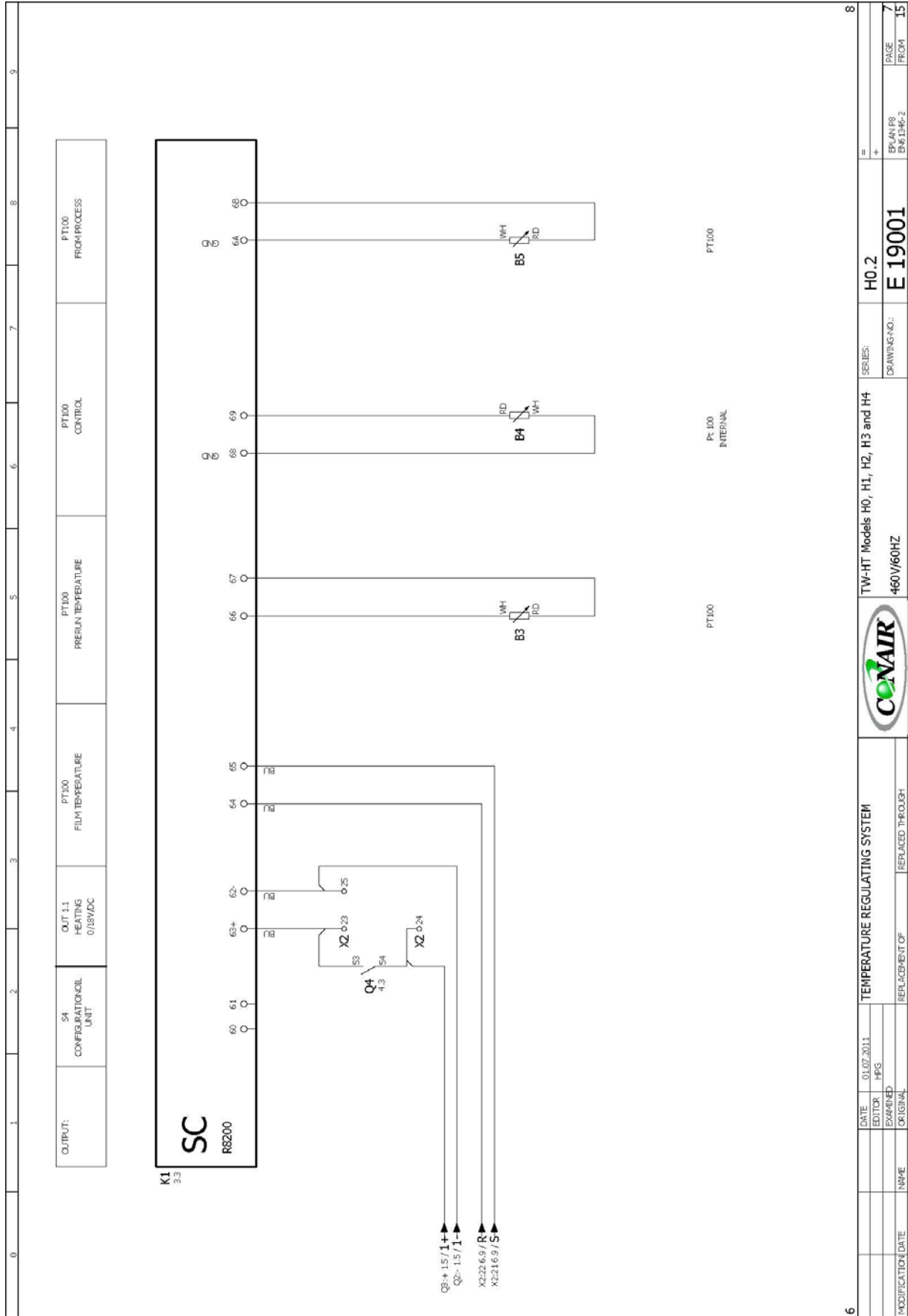


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2		H0.2		TW-HT Models H0, H1, H2, H3 and H4		460V/60HZ	
=		+		E 19001		EPLAN P8	
1		1		EPLAN P8		EPLAN P8	
15		15		EPLAN P8		EPLAN P8	





0	1	2	3	4	5	6	7	8	9
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INTERFACE

K1
3.3

SC
R8200

INCOUL

70

71

72

73

74

7

9



0	1	2	3	4	5	6	7	8	9
TERMINAL DIAGRAM									
SIN_001									
TERMINAL STRIP X2									
FUNCTIONAL TEXT	NAME OF CABLE		TYPE OF CABLE		GOAL DESIGNATION		JUMPER		SIDE/COLUMN
	NAME OF CABLE		TYPE OF CABLE		GOAL DESIGNATION		JUMPER		
PE									3.4
0V/DC									3.4
0V/DC									3.5
0V/DC									3.5
0V/DC									3.5
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0V/DC									

SIN_001

TERMINAL DIAGRAM

SIN_001

FUNCTIONAL TEXT			TERMINAL STRIP X2										NAME OF CABLE		TYPE OF CABLE		SIDE/COLUMN										
			NAME OF CABLE	TYPE OF CABLE	GOAL DESIGNATION	CONNECTION	MM²	CLAMP	JUMPER	GOAL DESIGNATION	CONNECTION	NAME OF CABLE	TYPE OF CABLE	GOAL DESIGNATION	CONNECTION	NAME OF CABLE	TYPE OF CABLE	GOAL DESIGNATION	CONNECTION								
PE			W8	SD-F		PE	1,0 19534 -4L	PE	•		PE	W8	SD-F					5,5									
STB HEATING						1	1,0 19533 -4L 38											6,3									
STB HEATING						2	1,0 19533 -4L 19											6,3									
STB HEATING						3	1,0 19533 -4L 20											6,3									
PE						4	1,0 19534 -4L	PE	•									6,3									
PT100						RD	1,0 19533 -4L 21											6,7									
PT100						RD	1,0 19533 -4L 22											6,8									
HEATING SSR +							1,0 19533 -4L 23											7,2									
HEATING SSR +							1,0 19533 -4L 24											7,2									
HEATING -							1,0 19533 -4L 25											7,3									
FLOAT SWITCH						RD	1,0 19533 -4L 26											9,2									
FLOAT SWITCH						VE	1,0 19533 -4L 27											9,2									
FLOAT SWITCH						BN	1,0 19533 -4L 28											9,2									
FLOAT SWITCH						GN	1,0 19533 -4L 29											9,2									
MOTOR PROTECTION						GN	1,0 19533 -4L 30											9,3									
FLOW CONTROLLER							1,0 19533 -4L 31											9,4									
MOTOR PROTECTION							1,0 19533 -4L 32											9,7									
PE						62	1,0 19533 -4L	PE	•									10,4									
FLOW INDICATOR						PE	1,0 19534 -4L	PE	•									10,5									
FLOW INDICATOR						2-	1,0 19533 -4L 33											10,5									
FLOW INDICATOR						3+	1,0 19533 -4L 34											10,5									
FLOW INDICATOR						1	1,0 19533 -4L 35											10,5									

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DATE	01.07.2011	TEMPERATURE REGULATING SYSTEM	TW-HT Models H0, H1, H2, H3 and H4	SERIES:	H0.2	14
EDITOR	HPG	REPLACEMENT OF	460V/60HZ	DRAWING NO.:	E 19001	

[illegible]

PARTS LIST

CONSTR. DESIG.	QUANTITY	NUMBER	DESIGNATION	MODEL NUMBER	MANUFACTURER
X1	6	05273	TERMINAL BLOCKS	NR.: 280-641 2,5mm² 3-L	WAGO KONTAKTECHNIK
X1	2	05275	PE-CLAMP 3-WIRE	NR.: 280-637 2,5mm² 3-L	WAGO KONTAKTECHNIK
X2	5	19834	PE-CLAMP 4-WIRE	NR.: 2000-1407 1mm² 4-L	WAGO KONTAKTECHNIK
X2	7	19836	LINK PLUG	NR.: 2000-402 1mm² 2-FACH GR	WAGO KONTAKTECHNIK
X2	35	19833	TERMINAL BLOCKS	NR.: 2000-1401 1mm² 4-L	WAGO KONTAKTECHNIK

SIN_04_1033 / 1 Jan 2007

14

		DATE	01.07.2011	TEMPERATURE REGULATING SYSTEM				SERIES:	H0.2	=	
		EDITOR	HPG					DRAWING-NO.:	E 19001	+	
		EXAMINED									
		ORIGINAL									
MODIFICATION DATE	NAME			REPLACEMENT OF	REPLACED THROUGH					EPLAN PR	PAGE
										EN61346-2	FROM
											15
											15

Spare parts-list

TW-HT Model H0, H1, H2, H3 and H4 40.06 460V/60Hz SC-S

Parts No.	Expend. Parts	Qty. Parts	Description
14929	1.00	PUMP DS360.0064 480V 60HZ
12892	1.00	PRIM. 460V +/-5%
20387	2.00	HEATER ELEMENT WITH PROT.P 403C600/31/3X3R 460V
10973	1.00	RESISTANCE THERMOMETER W 6/150 m.1.5 m Messltg. 662°C {350°C}
04483	3.00	RESISTANCE THERMOMETER W 6/70 m.2,0 m Silikonltg.
20011	1.00	SAFETY TEMPERATURE OBSER HEATTHERM 60.2031/81 50-300°
17682	1.00	OPEN-/CLOSED LOOP CONTROL R 8200-S-1-SI1-0-6 24V/DC
06195	1.00	MAIN SWITCH KG41B T203/D-A194 VE
14268	1.00	MAGNETIC FLOAT SWITCH H0.2 ARV2-VSSS/HT200-L 440/12-V52A
14741	3.00	contactor DILM7-10 24V/DC
14747	1.00	AUXILIARY CONTACT DILA-XHI11
20116	1.00	MOTOR PROTECTION CIRCUIT B PKZM0-1,6
20118	1.00	MOTOR PROTECTION CIRCUIT B PKZM0-4
10105	2.00	RELAY 3GN1BH 75ADC-660VACSCR
16628	2.00	Relay 24V/DC 2 WECHSLER
02179	1.00	FINE WIRE FUSE 4.0 A 20x5 traege
04768	2.00	FUSE 10x38 6M 2S 500V/2A
04953	3.00	RC-ELEMENT SOLENOID VALVE VBS-RC 10/24 L Nr. 03124068
14871	1.00	SAFETY VALVE EINTR.1/2"IG AUSTR.1"IG 20BAR
03902	1.00	NON-RETURN VALVE VA R1/2" PN40
05393	1.00	SOLENOID VALVE SV04E4 3/8" M.SPULE M20 24VD
12490	1.00	DIFFER. PRESSURE TRANSMITT 14 PSI {0-1 bar},
01022	1.00	KEY 1004-06
07549	2.00	VITON-O-RING F. HEATER 49 x 3.5

Spare parts-list

TW-HT Model H0, H1, H2, H3 and H4 40.06 460V/60Hz SC-S

03620	.....	1.00	Viton-O-Ring f. cooling 64 x 3,5 BL-VI 1980
09691	.....	1.00	Seal f. SVL / SEL 6141S4 134/115 x 1,0
18443	.....	2.00	SEAL N1, D0, H0.2
06330	.....	6.00	SEAL F. SOLENOID VALVE S4-4146 aus SI 60 rot/pr
03938	.....	1.00	SEAL n. Sk. 358121 SBR 70 2 mm st.
08387	.....	2.00	SEAL 24x18x1 mm Mat.AFM 34
14394	.....	2.00	Flat Gasket Nr. 1400.0343 f. SAE-FI. 3/4"
03605	.....	1.00	strainer R 3/8" Nr. 112 30 03
10070	.....	1.00	MAGNETIC COIL M 20 24 VDC
04626	.....	1.00	ARMATURE SV 04 E m.O-Ring u.Feder
14872	.....	1.00	HEAT EXCHANGER INSERT STW 200/1...H0.2
14474	.....	1.00	STRAINER R 1/2" fuer T.Nr. 06916
10035	.....	2.00	AUXILARY SWITCH NHI-E-11-PKZ0
14445	.....	1.00	PUMP HT/CY4281.0026VA 460V 60HZ
06052	.....	1.00	PRESSURE SWITCH 901.51 114L2 Art.Nr.14419.0002
04627	.....	1.00	GUIDE TUBE SV 04 kompl. Nr. 5649902
20257	.....	1.00	2/2-WAY SOLENOID VALVE TYP 85320 G 1/2" NW 12 24VDC
10805	.....	5.00	SOCKEL "ZS-MODUL" f. 10x38 Sich. 1-polig 5106304
05321	.....	1.00	SOLENOID VALVE SV04E5 3/8" M.SPULE M20 24VD
04771	.....	3.00	FUSE 10x38 FLQ 500V/20A
06648	.....	1.00	VENTILATOR 3110KL-05-WB30 24V/DC

The right is reserved to carry out technical specification

-prices are valid for 3 months-

The specified number of expendable parts is only a pragmatcal value without obligation!

Acceptance-Record

Customer

Confirmation-No. **72677 / 11**

Type of unit **TW-HT Model H0, H1, H2, H3 and H4**

Unit-No. **11 2070**

1.0 Mechanical test

1.1 Pressure test ☒

1.2 Unit checked for leaks ☒

1.3 Pump checked for
 Output rate ☒
 Output pressure ☒

2.0 Check of the electrical equipment

2.1 Visual inspection of compliance with VDE-regulations

2.2 Overall performance according to circuit diagram No.:

2.3 Insulation test ☒

2.4 High voltage test 1000V_{AC} ☒

2.5 PE-conductor test < 0,1Ω ☒

2.5.1 Leakage current - mA

2.6 Float switch performance test ☒

2.7 Motor protection switch set to nominal current of 1,2/3,0 A

2.8 Flow monitoring
 Set to response point 205 °C
 Fault indication and performance checked ☒

2.9 Inlet temperature monitor
 Set to response temperature 401 °F
 Fault indication and performance checked ☒

2.10 Film temperature limiter ☐
 Set to response temperature
 Fault indication and performance checked

2.11 Performance check and current-values of the heating circuits ☒

Spannung 480 V
Voltage

	L1	L2	L3
I/II	7,1 / 7,1	7,1 / 7,1	7,1 / 7,1
III/IV			
V/VI			
VII/VIII			
IX/X			
XI/XII			

2.12 Cooling capacity 41800Watt ☒
 at 176°F to process temperature
 and 59°F cooling water inlet temperature

2.13 Flow measurement checked and adjusted ☒

2.14 Interface - performance checked Type ☐

Tester:

B. Müller ☐
J. Schöning ☒
S. Weber ☐

List of Parameters

Customer			Date	30.06.2011
Type of unit	TW-HT Model H0, H1, H2, H3 and H4		Type of controller	SC-Standard SV20/11
Number of unit	11 2070		Serial No	21311-034

Parameter designation		
Alarms and limit values		
Alarm limit		
1st setpoint	32-392 {0-200}	°F (°C)
2nd setpoint	32 {0}	°F (°C)
3rd setpoint	32 {0}	°F (°C)
Alarm to process	401 {205}	°F (°C)
Aqua timer	10	
Alarm flow	Off	
	5 l/min	
Alarm pressure high	Off	PSI
Alarm pressure low	Off	PSI
Alarm 2	32 {0}	°F (°C)
Upper setpoint limit	392 {200}	°F (°C)
Lower setpoint limit	32 {0}	°F (°C)
Alarm film temperature	Off	°F
Alarm		
From process limit	Off	°F
Cascade control		
System closing temperature	Off	°F
Device functions		
Draining time	10	s
Filling	Automatic	
Configuration change of water	n.v.	
Time for change of water	n.v.	s
Interval for change of water	n.v.	min
Change of water manually	n.v.	
Cooling before shut down	Co. OF	
Cooling mode	Indirect	
Selection of setpoint	Sollwert1	
External sensor		
actual value output / PB	Current	
Shut down temperature	122 {50}	°F (°C)
Aqua timer start time	60	min
Fill time max	2	min
Reclosing lockout	Off	
Parameter lock	Off	
Record. function: sample time	3 Mins. 12h	
Language	English	

List of Parameters

Customer		Date	30.06.2011	
Type of unit	TW-HT Model H0, H1, H2, H3 and H4		Type of controller	SC-Standard SV20/11
Number of unit	11 2070		Serial No	21311-034

Parameter designation		
Timer	n.v.	
Time of day	n.v.	
Weekday	n.v.	
Year	n.v.	
Month	n.v.	
Day	n.v.	
Service interval operating hours	Off	
Service interval year	n.v.	
Service interval month	n.v.	
Service interval day	n.v.	
Config. limit comparator	Offner	*
Config. collective alarm	Offner	*
Config. OUT13	Schließer	*
Programming c.OFF	c.OFF	
Unit of pressure	n.v.	
Unit of flow	l/min	
Factory setting	Off	
Name of unit		
Control		
Regulation ratio heating	100 %	
Regulation ratio cooling	100 %	
XP-heating	4.4 %	
TV-heating	25 s	
TN-heating	125 s	
XP-cooling	8.8 %	
TV-cooling	25 s	
TN-cooling	125 s	
Hyst. switch heating/cooling	Off	
Switch cycle time heating	4 s	
Switch cycle time cooling	10 s	
Temperature unit	°F	
Self-optimization		
Setpoint ramp increasing	Off	K/min
Setpoint ramp decreasing	Off	K/min
Switch on hyst. cooling	n.v.	
Switch off hyst. cooling	n.v.	
Act. value output: upper value	n.v.	
Act. value output: lower value	n.v.	

* Needs English translation

List of Parameters

Customer		Date	30.06.2011
Type of unit	TW-HT Model H0, H1, H2, H3 and H4	Type of controller	SC-Standard SV20/11
Number of unit	11 2070	Serial No	21311-034

Parameter designation		
Offset values		
Actual value offset int. sensor	Off	K
Actual value offset ext. sensor	Off	K
Actual value offset from process	Off	K
Actual value offset to process	Off	K
Actual value offset film temperature	Off	K
Flow offset	Off	gal/min
Threshold flow dP	20	mA
Cooling regul. ratio offset	Off	%
Interface		
Interface address	1	
Protocol	Off	
Baud rate	4.8	kb
Data format	7E1	
Profile controller		
Recipe 1	No Input	
Recipe 2	No Input	
Recipe 3	No Input	
Recipe 4	No Input	
Recipe 5	No Input	
Recipe 6	No Input	
Recipe 7	No Input	
Recipe 8	No Input	
Recipe 9	No Input	
Recipe 10	No Input	
Timer		
	On	Off
Mon	06:00	22:00
Tue	06:00	22:00
Wed	06:00	22:00
Thu	06:00	22:00
Fri	06:00	22:00
Sat	06:00	22:00
Sun	06:00	22:00

List of Parameters

Customer		Date	30.06.2011
Type of unit	TW-HT Model H0, H1, H2, H3 and H4	Type of controller	SC-Standard SV20/11
Number of unit	11 2070	Serial No	21311-034

Parameter designation			
EcoTemp			
Time 1		3.0	sec
Time 2		5.0	sec
Time 3		10.0	sec
Tool recipes			
Tool 1		No Input	
Tool 2		No Input	
Tool 3		No Input	
Tool 4		No Input	
Tool 5		No Input	
Tool 6		No Input	
Tool 7		No Input	
Tool 8		No Input	
Tool 9		No Input	
Tool 10		No Input	
Tool 11		No Input	
Tool 12		No Input	
Tool 13		No Input	
Tool 14		No Input	
Tool 15		No Input	
Tool 16		No Input	
Tool 17		No Input	
Tool 18		No Input	
Tool 19		No Input	
Tool 20		No Input	

Declaration of conformity
within the meaning of the PRESSURE EQUIPMENT DIRECTIVE 97/23/EG

Manufacturer: The Conair Group 24-hr Instant Access Parts and Service:
415 Allegheny Blvd. 800.458.1960 (USA and Canada)
Franklin, PA 16323 U.S.A +1.814.437.6861

tel: +1-814-437-6861
www.conairgroup.com

We hereby declare, that the
designation:

Conair Temperature Control Unit

type: TW-HT Model H0, H1, H2, H3 and H4

unit N°.: 112070-71

agree with the guideline 97/23/EG, and was verified by the follow conformity assessment procedur:

conformity assessment procedur: module **A** assembly of the category

The assembly consists of the follow pressure equipment:

part no.	max. operat. pressure	volume	conformity assessment procedure:
8783	319 PSI {22 bar}	1.2 gal {4.6 liter}	Module A
8784	406 PSI {28 bar}	0.45 gal {1.7 liter}	Art.3 / Abs.3
14289	377 PSI {26 bar}	0.16 gal {0.6 liter}	Art.3 / Abs.3
20011			Module B+D
14871	290 PSI {20 bar}		TÜV-SV.07-666
14445	362 PSI {25 bar}		
---	406 PSI {28 bar}	---	Art.3 / Abs.3

Declaration of conformity

within the meaning of the EC machinery directive-lines 2006/42/EG, annex II 1.A

Manufacturer: The Conair Group 24-hr Instant Access Parts and Service:
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Franklin, PA 16323 U.S.A +1.814.437.6861

tel: +1-814-437-6861
www.conairgroup.com

We hereby declare, that the Conair-temp.control unit

Designation:

Type: TW-HT Model H0, H1, H2, H3 and H4 Unit N°: 112070 - 112071

complies with the following documents and regulations.

Applied, harmonized standards, in particular

DIN EN ISO 12100-1:2003
EN 60204-1 :2006

Documents: Manual

Regulations: EMV-Richtlinie 2004/108/EG



Operation / Construction

2.1. Correct use of equipment

The heat-balancing unit type TW-HT is suitable for water as circulating medium at temperatures of up to 392°F {200°C}. Unit type TW-HTM is suitable for water as circulating medium at temperature up to 437°F {225°C}.

In order to prevent malfunctions, please take note of the data regarding the water quality (☞ "Water quality" in the technical Documentation).



2.1.1. Notes on safety for the operator

- Only carry out authorized work on the unit when it has been isolated from the electric power supply!
- Adhere to the general rules regarding safety in the electrical engineering sector!
- Always wear protective clothing when working on hot machine components!
- Turn the plant OFF when leaks occur! Rectify the fault!
- Check tightness of pipe-line fittings and connections at operating temperature!
- Coupled-up pipes and connecting lines get hot!



Risk of getting burnt !

- Hot steam escapes when the safety valve responds during a malfunction. Turn the unit OFF at once and allow it to cool down!
- Do not open the hydraulic section at temperatures above 194°F {90 °C}! The unit is pressurized!
- There is a high risk of sustaining burns from escaping steam!

2.2. Transport and storage

2.2.1. Transport

Transport the heat-balancing unit **in an upright** position.
Empty the unit completely before transporting!

The unit is mobile (roller mounted).

2.2.2. Storage

Storing temperature: +41°F {5 °C} ...+122°F {50 °C}

Store heat-balancing units in dry, closed rooms.

2.3. Mechanical connection

2.3.1. Connecting the circulating medium

- Connecting the circulating medium

The consumer is connected to the heat-balancing unit with the connections marked

INLET and RETURN

Hoses and connections must be absolutely leak-proof, as well as heat- and pressure-resistant. We recommend, that metal-armoured Teflon-hoses are employed for this purpose, or that special corrugated metal hoses are used, equipped at either end with the correct size of fitting.

The connecting sizes for the heat-balancing unit are given in the enclosed dimensions sheet.

- Connecting the cooling water

The cooling water connections on the heat-balancing unit are marked

Cooling water inlet and Cooling water return

Cooling water pressure: Δp min. 45.5 PSI {3 bar} max. 87 PSI {6 bar}

If cooling water inlet and outlet are being cut off, a safety valve between unit and shut off valve with an expanding pressure of 87 PSI {6 bar} has to installed by customer.

Optional: Connection for separate filling

If the temperature control unit is equipped with separate filling, a corresponding water supply connection is required.

The connection is marked "**Filling**".

2.3.2. Electrical connection

Before connecting and commissioning the heat-balancing unit, please ensure that the mains supply is identical with that on the machine label!



Connect the unit to a properly installed socket-outlet, which is protected by slow fuses, or to any other suitable supply!

The heat-balancing unit's total connected load can be found either in the circuit diagram or on the performance label.

The unit has been wired in our factory for connection to a clockwise rotating 3 phase supply.

Connect the cable as follows:

Phase	Colored cable	Numbered cable
L1	black	black 1
L2	brown	black 2
L3	grey	black 3
PE	green/yellow	green/yellow

Ensure that the installation meets the requirements of your local Electricity Authority and the Safety at Work Code of Practice!

2.4. Commissioning / Operation

2.4.1. Filling the heat-balancing unit as well as the consumer

Type:			Internal capacity::		
TW-HT	-...-	H0	ca.	1 gal	{4 liter}
TW-HT	-...-	H1	ca.	1 gal	{4 liter}
TW-HT	-...-	H2	ca.	6.6 gal	{25 liter}
TW-HT	-...-	H3	ca.	17 gal	{65 liter}
TW-HT	-...-	H4	ca.	22 gal	{84 liter}
TW-HTM	-...-	H/K	ca.	0.7 gal	{3 liter}

After switching on the power supply the respective operating status is indicated.

With the "Filling" parameter two different filling modes can be selected.

- Manual filling "Filling" parameter = Manual
- Automatic filling "Filling" parameter = Automatic

Automatic filling:

If the heat-balancing unit is set to the automatic filling position, it fills automatically with heat-transfer medium from the supply-source through the level control. It is imperative, that the supply line for the medium is open and that the medium supplied is as clean and as free from chalk as possible. (⇒Water quality)

Although this filling method facilitates working, there is always a risk of contamination and firing-up of heating circuit and pump, however.

2.4.2. Venting

The heat-balancing unit is vented through the automatic system shut-off.

2.4.3. Operation

Turn on the temperature control unit with the "I" (green) button.

After setting the desired temperature in the control field, the temperature of the external system can be regulated.

It is advisable to check whether the heat transfer fluid is flowing through all the return lines from the mould to the temperature control unit.

If the heat-balancing unit is operated at above 194°F {90°C}, a temperature-controlled solenoid valve shuts the system off to the outside. That allows the heat-transfer medium to stay liquid even at temperatures above 212°F {100°C}.

2.4.4. Shutting the plant down

On principle, the heat-balancing unit should be cooled down to approx. 140°F {60°C} before it is switched OFF.

There are 2 possibilities for achieving this:

- The set point is set to 140°F {60°C} in the control field with the "+/-" buttons and confirmed with the "ENTER" button.
This will result in the entire system being cooled down to 140°F {60°C}.
Following this the button "0" (red) can be operated in order to turn off the temperature control unit.
- If the control is programmed to carry out the cooling automatically, then the temperature control unit automatically cools down to the programmed value.

In both cases the temperature control unit still remains under power.

In order to completely remove the unit from the power supply the main switch must be turned off or the connection plug pulled (see control handbook).

2.4.5. Taking the unit into operation again

Once the unit had been shut down, as described under "Shutting down", proceed as follows for taking it into operation again:

Connect the power supply and turn on the main switch.

The temperature control unit is switched on with the green "I" button.

The pump starts running and the heating, i.e. cooling is automatically activated. The operating status of the temperature control unit is displayed continuously.

2.5. Temperature Control Unit Options

2.5.1. Connection and activation of the external temperature sensor

The plug for the external temperature sensor is located in the door of the control cabinet. The switch to activate the sensor is also located in the control cabinet door, however the sensor can also be activated through the control system (SC) parameter Sen=on.

2.5.2. Mold evacuation

The temperature control unit is able to evacuate the mold using compressed air. The activation of the mold evacuation can be activated selecting the control parameter CHG of the control system.

Attention: The mold evacuation requires that the water/system be below 176°F {90°C}.

During the mold evacuation, the compressed air will be routed through the mold and through the temperature control unit. The water will be emptied via the cooling water return. After the mold evacuation, which is time dependent (adjustable), a solenoid valve opens to depressurize the system.

2.6. Maintenance

When using hard water for cooling purposes, descaling of the heat-exchanger must be carried out at regular intervals (e.g. once every 12 weeks). Also refer to Chapter - "Descaling".

When refilling with fresh water, we recommend adding an anti-corrosion agent to the heat transfer medium.

We can supply appropriate information at request.

Anti-corrosion agent suitable for use units can also be obtained from us.

The solenoid- and non-return valves installed must be checked regularly for correct functioning.

The dirt-traps installed at the cooling water inlet and in the heat-balancing unit's return line must be cleaned **regularly**. This requires the dirt trap to be opened, so that the screen insert can be cleaned.


Components found to be faulty must be exchanged immediately. Replacement parts can be obtained from our Replacement Parts Department.

When ordering parts, it is imperative, that the
unit model and number
are quoted.

Also, a correct description of the component as well as its accurate
part number
must be quoted!

Retighten electrical terminal clamps and fuse caps regularly, at least once a year.

2.7 Troubleshooting

Problem	Possible cause	Solution
Alarm "Tank empty"	<ul style="list-style-type: none"> The medium in the expansion vessel is below the minimum level Unit has not been filled Cooling water supply not connected Cooling water supply is shut off Float switch is broken 	<ul style="list-style-type: none"> Fill the unit with medium Fill the unit Connect the cooling water supply Open the cooling water supply Check / replace the float switch
<p>Caution! </p> <p>The pump can only be taken into operation, when the medium is at the correct level.</p>		
Alarm Film temperature too high	<ul style="list-style-type: none"> Up to film-temperature (Safety alarm) 	<ul style="list-style-type: none"> Check the flow-rate (too little heat dissipated at the heater) Re-enable by actuating the "ON / OFF" button, or by mains-reset
Alarm Minimum flow undershot	<ul style="list-style-type: none"> no flow; only applies to unit equipped with flow monitoring 	<ul style="list-style-type: none"> No minimum flow Check flow-rate (clean the dirt-trap, if necessary).
Alarm pre-run temperature too high	<ul style="list-style-type: none"> Inlet temp. up to limiting value 	<ul style="list-style-type: none"> check the set limiting value Controller malfunction
Alarm Motor protection switch triggered	<ul style="list-style-type: none"> Phase missing Motor blocked 	<ul style="list-style-type: none"> Check motor protection switch i.e. release Check voltages Check motor

3. Appendix

3.1. Decalcification

Cleaning requirements:

Scale formation which adversely affects the required operation can be expected due to insufficient flow speeds, high temperatures, unfavourable turbulence, high degrees of hardness or strong contamination. Therefore, Conair recommends cleaning at regular intervals. Various factors and issues must be noted for the optimum cleaning of tempering machines and other affected system parts.

Instructions for optimum cleaning:

The cleaning agent flow rate should be similar to the normal flow rate. If the flow rate is smaller, the cleaning time is extended accordingly. Only use approved cleaning systems for the cleaning, e.g. decalcification pump SRG EKP 20 S U (Cleaning systems can be requested from Conair).

Decalcification and removal of inorganic coatings:

Fill the cleaning system with water, circulate the water and check the connections for leaks before the actual cleaning. Do not add the concentrated acids until there are no leaks. For example, 5 – 20% inhibited phosphoric acid (e.g. Beizer 640) should be used for the cleaning. The cleaning liquid must be pumped through the parts of the system to be cleaned. The formation of gas can be expected if calcium or similar deposits are present. It should be ensured that gases produced are purged and that no gas cushion is generated. In the case of gas formation, the formation of foam can also be expected; a suitable antifoam agent (e.g. ST-DOS S-913) should therefore be ready for use.

The cleaning is monitored using pH measurement. The pH value should be approx. 2.0 when phosphoric acid is used. If the pH value increases, the cleaning solution should be intensified with acid. However, a concentration of 40% should not be exceeded.

When the cleaning is complete (no rise of the pH value during the cleaning), the cleaning solution must be neutralised outside the tempering machine using an appropriate alkaline solution (e.g. sodium hydroxide, e.g. Beizer N-720) (pH value between 6.5 and 10.0) and can then be disposed of accordingly. Afterwards, the cleaned system must be carefully rinsed with clean water. For neutralizing the inhibited residual acid in the tempering machine, this must be treated with a weak sodium hydroxide solution (e.g. Beizer N-730) before the last rinsing.

If other cleaning chemicals are used, strictly observe the instructions and recommendations of the manufacturer or supplier.

Summary of the cleaning process:

- Product selection
- Completely disconnect heat exchanger / tempering machine from the mains power supply
- Connection of the cleaning pump (pump, hoses, preparation tank)
- Execution of the leak tightness test (only with water)
- Preparation of the cleaning solution

The basic principle is: First the water then the acid, otherwise it won't be placid!

- Circulation of the cleaning solution
- pH control. Monitoring of the cleaning progress and the tempering machine
- Completion of the cleaning / neutralisation outside the system
- Post-treatment / rinsing the cleaned system.

Suitable cleaning products and cleaning equipments can be ordered from, for example, Schweitzer-Chemie GmbH in 71691 Freiberg, <http://www.schweitzer-chemie.de>.

3.2. Water quality

REQUIREMENTS AND WATER-CARE FOR COOLING SYSTEMS (CHILLERS) AND TEMPERATURE CONTROL UNITS

Depending on the unit to be cooled or heat-balanced, certain requirements have to be met by the cooling water regarding its quality. In order to protect all parts of the unit against corrosion and scales, Conair recommends **as a matter of principle to treat the water with a suitable cleaning agent**, e.g. ST-DOS H-390 (anticorrosive as well as non-ferrous metal protector and hardness stabilizer). In addition, depending on the materials installed, the temperatures and the type of process, the following water quality data have to be met.

As a rule the following data apply:

HYDROLOGICAL DATA	MAX	UNIT
PH-value	7.5 – 9	-
Conductivity	< 150	mS/m
Total hardness	< 15	°dH
Carbonate hardness	< 4	°dH
Carbonate hardness in case of stabilization of hardness	< 15	°dH
Chlorid Cl	<100	mg/l
Sulphate-So ₄	< 150	mg/l
Ammonium NH ₄	< 1	mg/l
Iron Fe	< 0.2	mg/l
Manganese	< 0.1	mg/l
free from solids		

Furthermore the following applies:

1. Systems with stainless steel (e.g. V2A or V4A)
Chloride Cl Temp. < 122°F {50 °C} max. 100 mg/l
Chloride Cl Temp. 122°F {50 °C} up to 194°F {90 °C} max. 50 mg/l
Chloride Cl Temp. > 194°F {90 °C} max. 30 mg/l
2. Temperatures below 41°F {5°C}
When employing chillers at temperatures below + 41°F {5°C}, an anti-freeze medium with corrosion inhibitor must be added, e.g. ST-DOS F-190.
3. Temperatures over 194°F {90 °C}
in case the water is heated to over 90°C, we recommend the use of a water softener. For suitable water softening systems please feel free to ask Conair.
4. Temperatures over 248°F {120°C}
At water temperatures over 248°F {120°C} glycol may not be used.

If the recommended water qualities are not met, the components of the unit will be damaged due to corrosion and scales. Conair will not accept any liability for any such damages.

3.3. Flow-rate monitoring

Mode of operation:

The flow of the recirculating medium is monitored by a differential-pressure switch, which is a separate component. The pressure-gauging input ports are connected to the pump pressure stud (+).

The differential-pressure of the internal consumers (heater-bank, heat exchanger) is directly related to the flow-volume.

If the flow rate and thus the differential pressure drops below the set minimum value, the differential pressure switch triggers and switches off the heater. At the same time, the alarm "Flow rate too low" is displayed. The heater switches on again when the error has been rectified.

On heat-transfer systems, the fault will have to be acknowledged with the "ENTER" button!

Setting values of the differential-pressure switch: 1.4 PSI {0.1 bar} to 2.9 PSI {0.2 bar}.

Causes for alarm-triggering: Flow

- too high a pressure-loss in the external consumer
- dirt-filter in the return-line blocked
- possibly installed shut-off valves closed
- air trapped in pipe-lines and consumer

Fault rectification

- check, if the external consumer are contaminated
- remove and clean the green insert
- open the shut-off valves
- vent the system for that purpose, it is recommended to push the return-line hose of the unit into an open vessel and briefly switch the pump ON and OFF

With heat-transfer oil systems:

- Run the unit at about 212°F {100°C}.
That boils off any moisture.

If necessary, refill the system with new heat-transfer oil.

We're Here to Help


Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Department for a nominal fee. Most manuals can be downloading free of charge from the product section of the Conair website.
www.conairgroup.com

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

How to Contact Customer Service

To contact Customer Service personnel, call:



 **NOTE:** Normal operating hours are 8:00 am - 5:00 pm. After hours emergency service is available at the same phone number.

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department.

Before You Call...

If you do have a problem, please complete the following checklist before calling Conair:

- ☐ Make sure you have all model, control type and serial numbers from the serial tag, and parts list numbers for your particular equipment. Service personnel will need this information to assist you..
- ☐ Make sure power is supplied to the equipment.
- ☐ Make sure that all connectors and wires within and between control systems and related components have been installed correctly.
- ☐ Check the troubleshooting guide of this manual for a solution.
- ☐ Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- ☐ Check that the equipment has been operated as described in this manual.
- ☐ Check accompanying schematic drawings for information on special considerations.