P+ S6000B End User Maintenance Item Descriptions:

Service Item Description	ElectraTherm Part #	Miscellaneous Maintenance Item Requirements/Notes	Estimated Part Costs from ElectraTherm (USD)	*Estimated Maintenance Material Cost (USD)	Total Estimated Maintenance costs (USD)	Estimated Labor Hours Required for Service (hours)	Required Service Maintenance Interval (hours)
Inspect all plumbing, flanges, and valves for leaks		*use liquid leak detector		$ 10.00	$ 10.00	1	4400
Inspect hardware for wear/damage		manually actuate valves			$ -	0.5	4400
Grease pump motor bearings		*grease bearings on working fluid feed pump		$ 25.00	$ 25.00	1	4400
Clean cabinet heat exchanger		visual inspection and cleaning			$ -	1	4400
Inspect for electrical wear/damage		visual inspection			$ -	0.5	4400
Check for NCGs in working fluid		machine shutdown for 5 minute test			$ -	0.5	4400
Check HX water-side pressure drop		measure and record pressure drop			$ -	0.5	8800
Clean Skid / Clean LLR					$ -	2	8800
Verify operability of safety equipment		*visual inspection of buttons, lights, and labels			$ -	0.5	8800
Replace High/Low Sides PRVs	ET11397 x2 ET11405 x2	replace per local code requirement	$ 1,671.43		$ 1,671.43	3	17600
Replace PLC battery	ET11214 x1		$ 15.00		$ 15.00	0.5	17600
Bitzer Expander Replacement		expander is replaced at site (requires gas transfer)	$ 29,168.00		$ 29,168.00	16	35200
Replace VFD internal cooling fan		from VFD manufacturer		$ 300.00	$ 300.00	1	26400
					$ -		
					$ -		
					$ -		

Current maintenance intervals are conservative, and may be extended based on field experience.

Estimated hours are based on time to perform service at site, and do not include any mobilization or transportation time to and from the site.

***Maintenance items that are not supplied by ElectraTherm. Cleaning supplies, leak detector solution--these items should be available locally.**

****The cost for the expander exchange listed here is an amount NET of the following transactions: Owner will issue payment for the amount of a new expander (greater than the amount listed here) and receive a refund when the owner has returned the expander being removed from service, and that used expander is in condition to be rebuilt and or refurbished.**

*****PRVs should be replaced immediately if they discharge or show signs of water ingress. PRVs should be replaced at the interval required by local code or every 5 years, whichever is less.**

Detailed instructions and part number details are provided in Operation and Maintenance Manual, available from ElectraTherm Service Department.

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P+ Series 6000B: 4 Year End User Routine Maintenance Schedule

ElectraTherm
BY BITZER GROUP

CUMULATIVE RUN TIME HOURS

	1 YEAR(8760 HOURS PER YEAR)						2 YEARS(8760 HOURS PER YEAR)						3 YEARS(8760 HOURS PER YEAR)						4 YEARS(8760 HOURS PER YEAR)					
	4400HR SERVICE ITEMS			8800HR SERVICE ITEMS			13200HR SERVICE ITEMS			17600HR SERVICE ITEMS			22000HR SERVICE ITEMS			26400HR SERVICE ITEMS			30800HR SERVICE ITEMS			35200HR SERVICE ITEMS		
	SERVICE INTERVAL 1			SERVICE INTERVAL 2			SERVICE INTERVAL 3			SERVICE INTERVAL 4			SERVICE INTERVAL 5			SERVICE INTERVAL 6			SERVICE INTERVAL 7			SERVICE INTERVAL 8		
REQUIRED SERVICE ITEMS	**ITEM**	**HRS**	**COST**	**ITEM**	**HRS**	**COST**	**ITEM**	**HRS**	**COST**	**ITEM**	**HRS**	**COST**	**ITEM**	**HRS**	**COST**	**ITEM**	**HRS**	**COST**	**ITEM**	**HRS**	**COST**	**ITEM**	**HRS**	**COST**
Inspect all plumbing, flanges, and valves for leaks	♦	1	$ 10	♦	1	$ 10	♦	1	$ 10	♦	1	$ 10	♦	1	$ 10	♦	1	$ 10	♦	1	$ 10	♦	1	$ 10
Inspect hardware for wear/damage	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -
Grease pump motor bearings	♦	1	$ 25	♦	1	$ 25	♦	1	$ 25	♦	1	$ 25	♦	1	$ 25	♦	1	$ 25	♦	1	$ 25	♦	1	$ 25
Clean cabinet heat exchanger	♦	1	$ -	♦	1	$ -	♦	1	$ -	♦	1	$ -	♦	1	$ -	♦	1	$ -	♦	1	$ -	♦	1	$ -
Inspect for electrical wear/damage	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -
Check for NCGs in working fluid	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -	♦	0.5	$ -
Check HX water-side pressure drop				♦	0.5	$ -				♦	0.5	$ -				♦	0.5	$ -				♦	0.5	$ -
Clean Skid / Clean LLR				♦	2	$ -				♦	2	$ -				♦	2	$ -				♦	2	$ -
Verify operability of safety equipment				♦	0.5	$ -				♦	0.5	$ -				♦	0.5	$ -				♦	0.5	$ -
Replace High/Low Sides PRVs										♦	3	$ 1,671												
Replace PLC battery										♦	0.5	$ 15												
Bitzer Expander Replacement																						♦	16	$ 29,168
Replace VFD internal cooling fan																♦	1	$ 300						
Service Interval Parts Total (USD)			**$ 35**			**$ 35**			**$ 35**			**$ 1,721**			**$ 35**			**$ 335**			**$ 35**			**$ 29,203**
Service Interval Labor Hours Total		**4.5**			**7.5**			**4.5**			**11**			**4.5**			**8.5**			**4.5**			**23.5**	

Current maintenance intervals are conservative, and may be extended based on field experience.

Estimated hours are based on time to perform service at site, and do not include any mobilization or transportation time to and from the site.

Costs shown are in USD.

4 Year Part Total (USD):	$31,434.43
4 Year Labor Hours Total:	68.5

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P+ S6000B: 20 Year End User Maintenance Schedule

ElectraTherm
BY BITZER GROUP

CUMULATIVE RUN TIME HOURS

REQUIRED SERVICE WORK	4400	8800	13200	17600	22000	26400	30800	35200	39600	44000	48400	52800	57200	61600	66000	70400	74800	79200
Inspect all plumbing, flanges, and valves for leaks	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Inspect hardware for wear/damage	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Grease pump motor bearings	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Clean cabinet heat exchanger	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Inspect for electrical wear/damage	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Check for NCGs in working fluid	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Check HX water-side pressure drop		♦		♦		♦		♦		♦		♦		♦		♦		♦
Clean Skid / Clean LLR		♦		♦		♦		♦		♦		♦		♦		♦		♦
Verify operability of safety equipment		♦		♦		♦		♦		♦		♦		♦		♦		♦
Replace High/Low Sides PRVs				♦						♦						♦		
Replace PLC battery				♦						♦						♦		
Bitzer Expander Replacement								♦								♦		
Replace VFD internal cooling fan						♦						♦						♦

Continued Maintenance Schedule below

CUMULATIVE RUN TIME HOURS

REQUIRED SERVICE WORK	83600	88000	92400	96800	101200	105600	110000	114400	118800	123200	127600	132000	136400	140800	145200	149600	154000	158400	162800	167200	171600	176000
Inspect all plumbing, flanges, and valves for leaks	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Inspect hardware for wear/damage	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Grease pump motor bearings	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Clean cabinet heat exchanger	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Inspect for electrical wear/damage	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Check for NCGs in working fluid	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Check HX water-side pressure drop		♦		♦		♦		♦		♦		♦		♦		♦		♦		♦		♦
Clean Skid / Clean LLR		♦		♦		♦		♦		♦		♦		♦		♦		♦		♦		♦
Verify operability of safety equipment		♦		♦		♦		♦		♦		♦		♦		♦		♦		♦		♦
Replace High/Low Sides PRVs				♦						♦						♦						♦
Replace PLC battery				♦						♦						♦						♦
Bitzer Expander Replacement						♦								♦								♦
Replace VFD internal cooling fan						♦						♦						♦				

Current maintenance intervals are conservative, and may be extended based on field experience.

* PRVs should be replaced immediately if they discharge or show signs of water ingress. PRVs should be replaced at the interval required by local code or every 5 years, whichever is lower.

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