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Cost estimate ECAL Power circuit - Prototype SM

	Object	Type	(HT) CHF unit	Qte	Remark	
Elem 1	Exchanger 1	Estimated from regulation	2000	1	Gasketed plate	2000
	Pump, Ecal circuit	Grundfos CRNE 1-30	2500	1	Variable speed drive 0.2-0.6 l/s 5-10 bars	2500
	Regulating valve	Estimated from regulation	2800	1	cast iron	2800
	Filter	Cartridge	600	1	Stainless steel	600
Elem 2	Temperature probes	ABB (Vincent Marinelli)	150	6	Pt100 Class A stainless steel, easy to insert	900
	Transmitter	Agilent 34970A			Already in regul costs	
	Flowmeter	Krohne H250 Variable area	2500	2	Visual indication + 4-20mA	5000
	Valves (ball)	cern store	40	9	Stainless steel	360
	Automated valve		400	1	for automated ater filling	400
	Manometers +4-20mA		120	2		240
	Manometers Bourdons	cern store	80	2		160
	DeltaP measurement	ASK 800 ABB Automation	1800	1	Pressure drop measurement	1800
	Air valve	Armstrong	400	1	De aerating	400
	Expansion vessel	Pneumawell	300	1		300
Elec	Already in regul costs					
	Cabling	Estimated 3 days	400	3		1200
Piping	Tubes price	DN32 PN25 Stainless steel	20	20	Estimated to be 20 m	400
	Elbows, flanges…	Stainless steel	25	32	12 flanges + 20 elbows	800
	Piping	From module0 (Zigliotto)	5000	1	only piping	5000
						24860
Margin	10%	**TOTAL (HT) KCHF**	**27**			

Installation in building 887

	Link to chilled water	DN25 Insulated	70	12	Material + manpower	840
	Link to demineralised water	DN40	60	30	Material + manpower	1800
	From rack to Super module	DN40 Insulated	90	20	Material + manpower	1800
	From rack to Super module	DN20	50	20	Material + manpower	1000
	Valves …	Ball Valve	40	6		240
Margin	10%	**Installation (HT) KCHF**	**6**			

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Cost estimate ECAL Regulating circuit - Prototype SM

	Objet	Type	(HT) CHF unit	Qte	Remarque	
Elem 1	Exchanger 1	Alpha laval M3-FM	1500	1	Gasketed plate	1500
	Exchanger 2	Alpha laval M3-FM	1500	1	Gasketed plate	1500
					Over dimensionned, alternative: Ruetschi L-3-80-2	
	Pump, intermediate loop	Grundfos CRNE 1-3	1800	1	2100CHF without variable speed drive	1800
	Pump, Ecal circuit	Grundfos CRNE 8-60	3600	1	Variable speed drive 1.2-2.8 l/s 1.5-4 bars	3600
	Immersion heater	Chromalox TV 77035	700	1		700
	Power controller for heater	Eurotherm TE10A	500	1		500
	Regulating Valve	SAMSON 241 DN15	2800	1	Cast iron	2800
	Filter		600	2	stainless steel	1200
Elem 2	T probes	ABB	150	7	Pt100 Class A stainless steel, easy to insert	1050
	Calibrated T=f(R) T probes	ABB	600	2	Pt100 stainless steel, easy to insert	1200
	Temperature measurement	Agilent 34970A	3000	1	2card, can measure 20 T probes	3000
	Flowmeters	Krohne H250 Variable area	2500	3	Visual indication + 4-20mA	7500
	Automated valve		400	1		400
	Manometers +4-20mA		120	2		240
	Valves (ball)	CERN store	40	11	Stainless steel	440
	Manometers Bourdons	CERN store	80	4	Stainless steel	320
	Differential pressure	ASK 800 ABB Automation	1800	1	Pressure drop measurement	1800
	Air valve	stainless steel - Armstrong	400	2		800
	Expansion Vessel	Pneumawell	400	2		800
Elec	PC programming			1		0
	PC	Cern store	4000	1		4000
	Software	Wizcon + WizPLC…			Provided by ST-CV	
	Schneider Quantum PLC		0	1	~ 30 I/Os + CPU + Com	0
	Electrical cabinet	from M0 GTIE	8000	1	Power and Regulating	8000
	Electric plans	Estimation	400	1		400
	Cabling	Estimated 5 days	400	5		2000
Piping	Tubes price	DN40 PN25 Stainless steel	30	20	Estimated 20 m	600
	Elbows, flanges…	stainless steel	50	32	12 flanges + 20 elbows	1600
	Execution plan	Estimation	500	1		500
	Piping assembly	From Module0 (Zigliotto)	10000	1	structure + piping	10000
Isolation	Isolation of pipes	From Module0 (Isoltesa)	12000	1	material(Armaflex 32mm) + manpower	12000
Control	Development of Control strategy and architecture		0	1	?? Not yet determined	0
			70250			
Margin	10%	**TOTAL (HT) KCHF**	**77**			