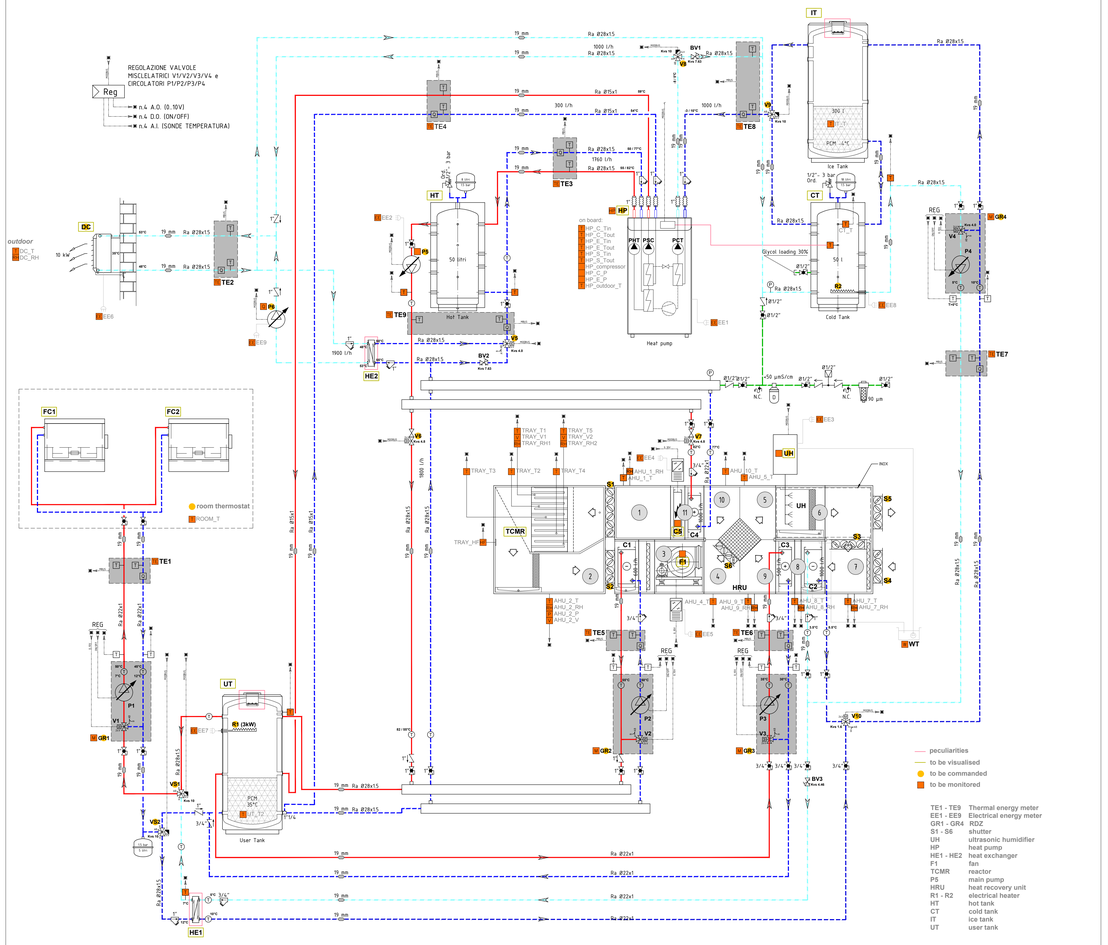
VALVES

Ref	Description	Technical Data		
		DATA	U.M.	
V1 V2 V3	3 way mixing valve (in GRx)	kvs	m³/h	-
		Size	DN	-
		Nominal voltage	Vac	24
		Control type	-	0.10V
V4	3 way mixing valve (BELIMO - R3075-L-S1+NR24A-MOD)	kvs	m³/h	4
		Size	DN	15
		Nominal voltage	Vac	24
		Control type	-	MODBUS
V5	3 way mixing valve (BELIMO - R3025-L-S2+NR24A-MOD)	kvs	m³/h	4
		Size	DN	-
		Nominal voltage	Vac	24
		Control type	-	MODBUS
V6 V7	2 way pressure independent control valve (BELIMO - EV020R2+BAC)	kvs	m³/h	4.8
		Size	DN	20
		Nominal voltage	Vac	24
		Control type	-	MODBUS
V8 V9	Changeover valve - L bore (BELIMO - R3025-BL2+NR24A-MOD)	kvs	m³/h	10
		Size	DN	25
		Nominal voltage	Vac	24
		Control type	-	MODBUS
V10	3 way mixing valve (BELIMO - R3075-VM-S1+NR24A-MOD)	kvs	m³/h	1.6
		Size	DN	15
		Nominal voltage	Vac	24
		Control type	-	MODBUS
VS1 VS2	Changeover valve - L bore (BELIMO - R3025-BL2+NR24A-MOD)	kvs	m³/h	10
		Size	DN	25
		Nominal voltage	Vac	24
		Control type	-	MODBUS
VB1 VB2	Balancing valve (CALEFFI - 130600)	kvs	m³/h	7.63
		Size	DN	25
		Nominal voltage	Vac	-
		Control type	-	-
VB3	Balancing valve (CALEFFI - 130500)	kvs	m³/h	4.46
		Size	DN	20
		Nominal voltage	Vac	-
		Control type	-	-

CIRCULATORS

Ref	Description	Model	Head at duty point	Power
P1	User pump	Inside GR1	Q = 800 l/h - H = 60 kPa (net head)	220V-50Hz
P2	Recovery pump	Inside GR2	Q = 600 l/h - H = 40 kPa (net head)	220V-50Hz
P3	Pre-Heating pump	Inside GR3	Q = 500 l/h - H = 30 kPa (net head)	220V-50Hz
P4	Cooling pump	DAB EVOPLUS 110/180 XM	Q = 1000 l/h - H = 110 kPa	220V-50Hz 170 W
P5	Heating pump	DAB EVOPLUS 110/180 XM (with multifunzione modul)	Q = 1800 l/h - H = 110 kPa	220V-50Hz 165 W
P6	Dry cooler pump	DAB EVOPLUS 80/180 XM (with multifunzione modul)	Q = 1900 l/h - H = 70 kPa	220V-50Hz 125 W
PCT	HP - evaporator pump	Inside Heat Pump	Q = 1000 l/h - H = 40 kPa (net head)	
PHT	HP - condenser pump	Inside Heat Pump	Q = 1750 l/h - H = 30 kPa (net head)	
PSC	HP - sub cooler pump	Inside Heat Pump	Q = 300 l/h - H = 15 kPa (net head)	



MAIN COMPONENTS

Ref	Description	Technical Data			
		DATA	U.M.	HEATING MODE	RECHARGING MODE
	Thermal carrier	Air flow	kg/s	0.264	0.200
TCM	Thermochemical Material Reactor	T air IN	°C	50	80
		x air IN	g/kg a.s.	20	8
		T air OUT	°C	35.3	51.3
		x air OUT	g/kg a.s.	12.7	16.6
		Air drop pressure	Pa	TBC	TBC
C1	Cooling coil	Heat exchanged	W	≈ 3000	-
		Air flow	kg/s	0.264 , 0.444	-
		T air IN	°C	35.7	-
		x air IN	g/kg a.s.	12.7	-
		T air OUT	°C	TBC	-
		x air OUT	g/kg a.s.	12.7	-
		Air drop pressure	Pa	TBC	-
		T water IN	°C	50	-
		T water OUT	°C	55	-
		Water drop pressure	kPa	< 15	-
F1	Fan	Power 220V/1~/50Hz	W	TBC	TBC
		Totale head pressure	Pa	TBC	TBC
		Dynamic pressure	Pa	TBC	TBC
		RPM des.max	1/min	? ?	? ?
HRU	Heat recovery unit	Efficiency	%	84.5	84.5
		By-Pass	Y/N	Y	Y
		T1 air IN	°C	67.6	51.3
		x1 air IN	g/kg a.s.	12.7	16.6
		T1 air OUT	°C	4.3	24.2
		x1 air OUT	g/kg a.s.	12.7	14.7
		Drained water	kg/h	0.0	1.35
		Air drop pressure	Pa	TBC	TBC
		T2 air IN	°C	25.4	11.3
		x2 air IN	g/kg a.s.	20	8
		T2 air OUT	°C	50.0	44.6
		x2 air OUT	g/kg a.s.	20	8
		Air drop pressure	Pa	TBC	TBC
		Production	kg/h (l/min)	6.92 (0.115)	-
U1	Induct Humidifier	Instal ster water flow rate	kg/h (l/min)	36 (0.6)	-
		Dimensions	WxDxH (mm)	571x256x309 mm	-
		Duct dimensions (mm)	WxDxH (mm)	671x856x430 mm	-
C2	Dehumidification and cooling coil	Heat exchanged	W	-	6050
		T air IN	°C	-	24.2
		x air IN	g/kg a.s.	-	14.7
		T air OUT	°C	-	11.3
		x air OUT	g/kg a.s.	-	8
		Air drop pressure	Pa	-	33
		T water IN	°C	-	3.5
		T water OUT	°C	-	12.5
		Water flow	l/h	-	1150
		Glycol	%	-	30
		Water drop pressure	kPa	-	< 27.3
C3	Pre heating coil (PCM)	Heat exchanged	W	2500	-
		T air IN	°C	25	-
		x air IN	g/kg a.s.	10.20	-
		T air OUT	°C	TBC	-
		x air OUT	g/kg a.s.	same as input	-
		Air drop pressure	Pa	TBC	-
		T water IN	°C	35	-
		T water OUT	°C	30	-
		Water flow	l/h	430	-
		Water drop pressure	kPa	< 15	-
C4	Heating coil	Heat exchanged	W	-	3120
		T air IN	°C	-	44.6
		x air IN	g/kg a.s.	-	8
		T air OUT	°C	-	80
		x air OUT	g/kg a.s.	-	8
		Air drop pressure	Pa	-	52
		T water IN	°C	-	82
		T water OUT	°C	-	77
		Water flow	l/h	-	1230
		Water drop pressure	kPa	-	< 9
C5	Power Heating coil	Power 220V/1~/50Hz	W	-	2000
		Heat exchanged	W	-	2000
		T air IN	°C	-	80
		x air IN	g/kg a.s.	-	8
		T air OUT	°C	-	90
		x air OUT	g/kg a.s.	-	8
		Air drop pressure	Pa	-	TBC
DC	Dry cooler	Heat exchanged	W	10100	-
		T air IN	°C	35	-
		x air IN	g/kg a.s.	17.8	-
		T air OUT	°C	40.5	-
		x air OUT	g/kg a.s.	17.8	-
		Air drop pressure	Pa	25	-
		T water IN	°C	53	-
		T water OUT	°C	47.8	-
		Water flow	l/h	1720	-
		Glycol	%	30	-
		Water drop pressure	kPa	< 14	-
		Power 220V/1~/50Hz	W	290	-

MAIN COMPONENTS

Ref	Description	Technical Data		
		DATA	U.M.	
HE1	Plate Heat Exchanger	Heat exchanged	W	4000
		Water flow 1	kg/h	686
		Glycol 1	%	0
		T1 water IN	°C	12
		T1 water OUT	°C	7
		Water drop pressure 1	kPa	< 15
		Water flow 2	kg/h	775
		Glycol 2	%	30
		T2 water IN	°C	5
		T2 water OUT	°C	10
		Water drop pressure 2	kPa	< 15
HE2	Plate Heat Exchanger	Heat exchanged	W	11000
		Water flow 1	kg/h	1894
		Glycol 1	%	0
		T1 water IN	°C	55
		T1 water OUT	°C	50
		Water drop pressure 1	kPa	< 11
		Water flow 2	kg/h	2095
		Glycol 2	%	30
		T2 water IN	°C	48
		T2 water OUT	°C	53
		Water drop pressure 2	kPa	< 13
UT	User Tank (with blind flange)	Capacity	l	292
		Size	mmxmm	Ø650x1499
		Weight	kg	64
		Electric Heater	kW	3 (230V~50H 1~)
CT	Cold Tank (-10 ± T ± +95°C)	Capacity	l	51
		Size	mmxmm	Ø343x1000
		Weight	kg	16
HT	Hot Tank	Capacity	l	51
		Size	mmxmm	Ø343x1000
		Weight	kg	16
IT	Ice Tank with blind flange (-10 ± T ± +95°C)	Capacity	l	292
		Size	mmxmm	Ø650x1499
		Weight	kg	64
GR1	Motorized Temperature Mixing Unit (RDZ - QM VJ DN25)	Type actuator	l	0.10V - 24 V
		Distance between connections	mm	125
		Power supply	V/HZ/phase	230/50/1
GR2	Motorized Temperature Mixing Unit (RDZ - QM VJ DN25)	Type actuator	l	0.10V - 24 V
		Distance between connections	mm	125
		Power supply	V/HZ/phase	230/50/1
GR3	Motorized Temperature Mixing Unit (RDZ - QM VJ DN25)	Type actuator	l	0.10V - 24 V
		Distance between connections	mm	125
		Power supply	V/HZ/phase	230/50/1
FC1 FC2	Existing Fan coils			
TEx	Ultrasonic heat meter (Engelmann - Sensostar U DN20)	Measurament type	-	ultrasonic technology
		qp flow	m³/h	1.5
		qs flow	m³/h	3

LEGENDA SIMBOLI

- VASO DI ESPANSIONE DA X LITRI CON MEMBRANA - PRECARICA Y BAR
- TERMOMETRO f.s. 120°C
- MANOMETRO 0.6 bar
- VALVOLA DI SICUREZZA CON SCARICO A VISTA SIFONATO
- VALVOLA A SFERA FILETTATA
- VALVOLA DI RITEGNO FILETTATA
- FILTRO A Y CON CARTUCCIA IN ACCIAIO INOX
- VALVOLA DI TARATURA CON PRESE DI PRESSIONE
- VALVOLA AUTOMATICA DI SFIATO ARIA
- GIUNTO ANTIVIBRANTE FILETTATO
- DISAERATORE FILETTATO CON SCARICO
- RUBINETTO PRESA CAMPIONE
- VALVOLA A 3 VIE DI COMMUTAZIONE
- VALVOLA A 3 VIE MOTORIZZATA (MODULANTE)
- VALVOLA A 2 VIE MOTORIZZATA MODULANTE CON CONTROLLO DELLA PRESSIONE A MONTE, MISURA DELLA PORTATA ED DELL'ENERGIA
- FILTRO A RETE MICROMETRICO
- CIRCOLATORE A PORTATA VARIABILE (INVERTER)
- DISCONNETTORE A PRESSIONI CONTROLLABILI (TIPO BA)
- DEMMERALIZZATORE CON CARTUCCIA A PERDERE

LEGENDA COLORI

- CIRCUITO CALDO - MANDATA
- CIRCUITO CALDO - RITORNO
- CIRCUITO GLICOLATO - MANDATA
- CIRCUITO GLICOLATO - RITORNO
- ACQUA FREDDA POTABILE
- COMANDO ELETTRICO

- Acc_Ø26x1 TUBAZIONE IN ACCIAIO
- Rg_Ø26x1 TUBAZIONE IN RAME
- MS_Ø26x1 TUBAZIONE IN MULTISTRATO
- PEXX_Ø26x1 TUBAZIONE IN PEAD PNXX
- PE100_Ø26x1 TUBAZIONE IN PE 100
- SS SPESSORE ISOLAMENTO TUBAZIONI X mm CONDUTTIVITA' TERMICA 0,040 W/(MK) a 40°C
- T SONDA DI TEMPERATURA
- U SONDA DI UMIDITA' RELATIVA
- Q MISURATORE DI PORTATA

CNR Consiglio Nazionale delle Ricerche

Progetto ESECUTIVO:
HORIZON HE DIT.AD017.170 ECHO - Efficient Compact Modular Thermal Energy Storage System (CUP B97G22000550006, GA 101096368)

Committente:
Consiglio Nazionale delle Ricerche (CNR), Istituto per le Tecnologie della Costruzione (ITC)
CNR ITC Sede Istituzionale Viale Lombardia, 49 - 20098 San Giuliano Milanese (MI)

R.U.P.:
Ing. Laura Fedele - CNR (Padova)

Oggetto:
Schema funzionale dell'impianto

Il tecnico:

Elaborato:
IT 1.0

Scala:

Note / Allegati:

Data:
maggio 2024

Progettazione:
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