

Interfaccia seriale per schede chiller • Serial interface for chiller cards
 Interface série pour cartes chiller • Serielle Schnittstelle Für Chiller-Steuerung
 Interface serie para tarjetas congelador

AER485



Contents

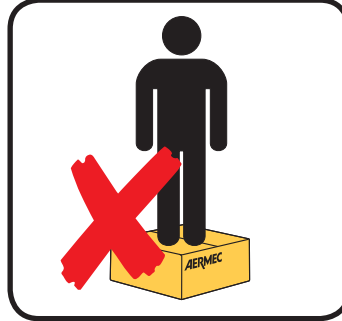
Precautions and safety regulations	13
EC declaration of conformity notes	13
AER485 General remarks	14
Connection between AER485, GR cards and AERWEB	15
AER485 connection with GR03	15
AER485 connection with GR03 and AerWeb30	15
AER485 connection with GR03, AerWeb30 and AerModem.....	16
AER485 connection with GR03, AerWeb30 and AerModem GSM.....	16
AER485 Dip Switch setting	17
Address conversion from decimal to binary	18
Table DIGITAL READ (Code 01)	19
Addresses table for BMS implementation	19
Table DIGITAL READ (Code 01)	20
Table DIGITAL WRITE (Code 05)	20
Table ANALOGUE WRITE (Code 06)	20
Table ANALOGUE READ (Code 03)	21

Precautions and safety regulations

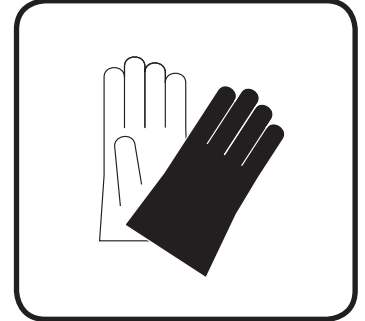
DO NOT wet the packaging



DO NOT tread on the packaging



Handle with care



Disposal instructions

Caution: this product contains electrical and electronic equipment that may not be disposed of through normal municipal waste collection channels. There are special centres for the separate collection of this material.

The electrical and electronic apparatus must be treated separately and in accordance with the relevant legislation in force in the country the apparatus is installed in. Batteries or accumulators in the apparatus must be disposed of separately in accordance with local regulations.

Notes on manuals

Store the manuals in a dry location to avoid deterioration, as they must be kept for at least 10 years for any future reference.

Carefully and thoroughly read all the information referred to in this manual. Pay particular attention to the usage instructions accompanied by the words "DANGER" or "WARNING" because, if not observed, they can cause damage to the machine and/or property and/or injury to people. If any kind of malfunction is not included in this manual, contact the local After Sales Service immediately. The device must be installed in such a way that maintenance and/or repair operations are possible.

The warranty of the device does not in any case cover costs owing to ladder trucks, lifts or other lifting systems that may be required in order to carry out the interventions under guarantee. AERMEC S.p.A. declines all liability for any damage due to improper use of the machine, or the partial or superficial reading of the information contained in this manual.

Safety symbols



Danger: power supply



WARNING



Danger: moving parts

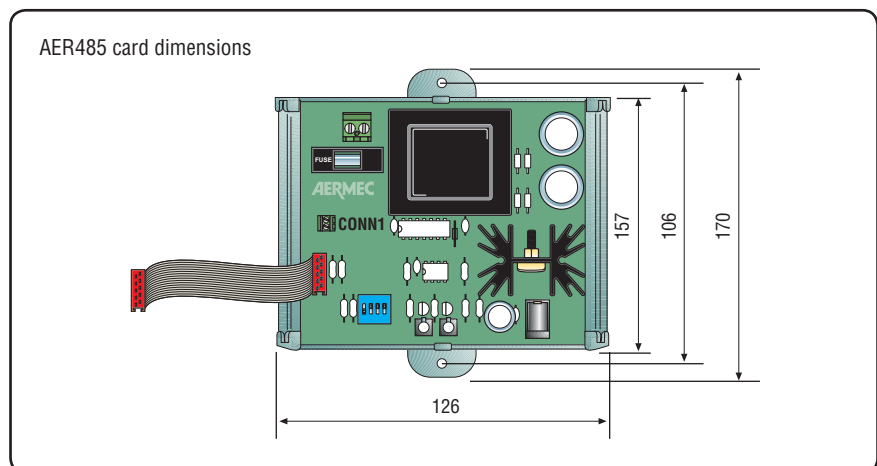
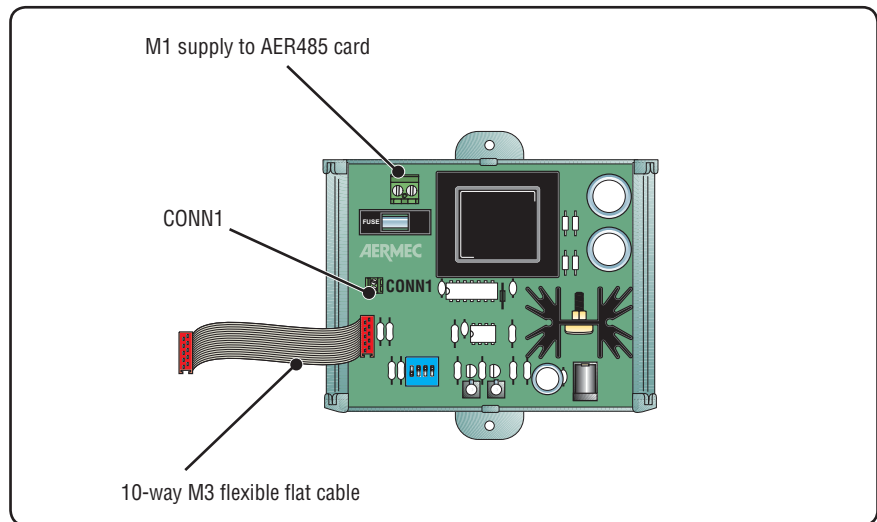
EC declaration of conformity notes

The accessory described in this manual may only be used in conjunction with the machine to which it has been designed. The EC declaration of conformity of the equipment to which it will be integrated is valid when this condition is satisfied. Refer to

the manual provided with the unit in order to check the list of compatible accessories.

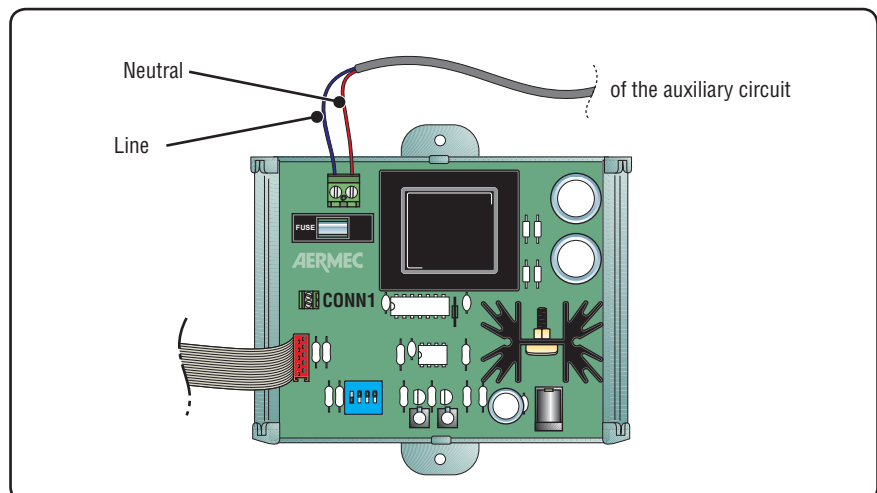
In general AER485

The AER485 accessory allows the interfacing of the Aermec cards, which equip the NRA/C, NBW, NLW, NRL series machines, to a communication network with RS485 electrical standard. This permits the use of the Modbus RTU protocol for the remote control of the machine. The software version of the display card must be 3.3 or later. This card is installed on the machine and connected to the display card.



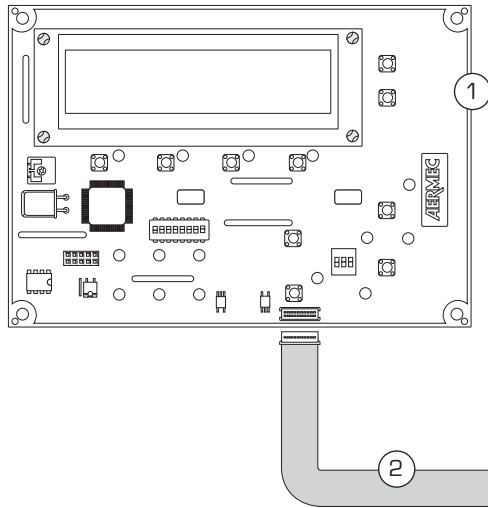
AER485 card supply

The L, N power supply of the auxiliary circuit must be connected to the M1 control board of the AER485 card.



Connection between AER485, GR cards and AERWEB

AER485 connection with GR03



- Key
- 1 - GR03 card
 - 2 - 10-way flexible flat cable
 - 3 AER485 card

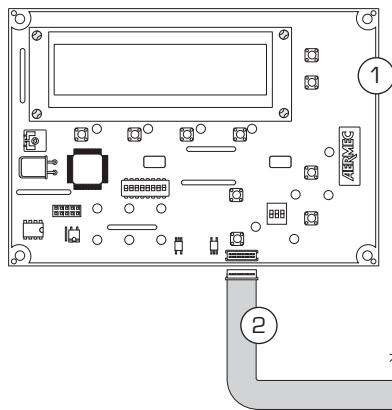
Serial connection (MODBUS protocol)

230V ~50Hz

AER485 connection with GR03 and AerWeb30

The supplied ferrite must be introduced onto the serial connection cable, positioning it close to the AER485 card. The installation of the ferrite must be carried out by twisting the cable around the ferrite two times.

- Key
- 1 - GR03 card
 - 2 - 10-way flexible flat cable
 - 3 AER485 card
 - 4 - AerWeb 30
 - 5 - RS485 serial cable
 - 6 - Serial connection
 - 7 - Ferrite
 - 8 - Pc

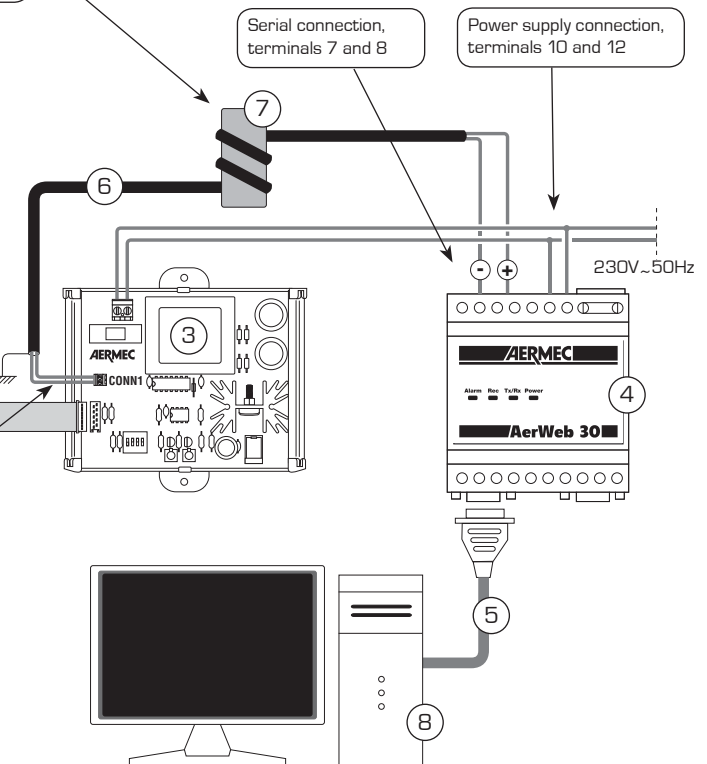


Serial connection, terminals 7 and 8

Power supply connection, terminals 10 and 12

230V ~50Hz

The serial connection between AER485 and AerWeb 30, must be carried out using shielded two-pole cable (connecting the shielding to earth); the name of the control board for the serial connection is CONN1; The poles indicated on the card represent:
 Pole A = POSITIVE POLE;
 Pole B = NEGATIVE POLE;



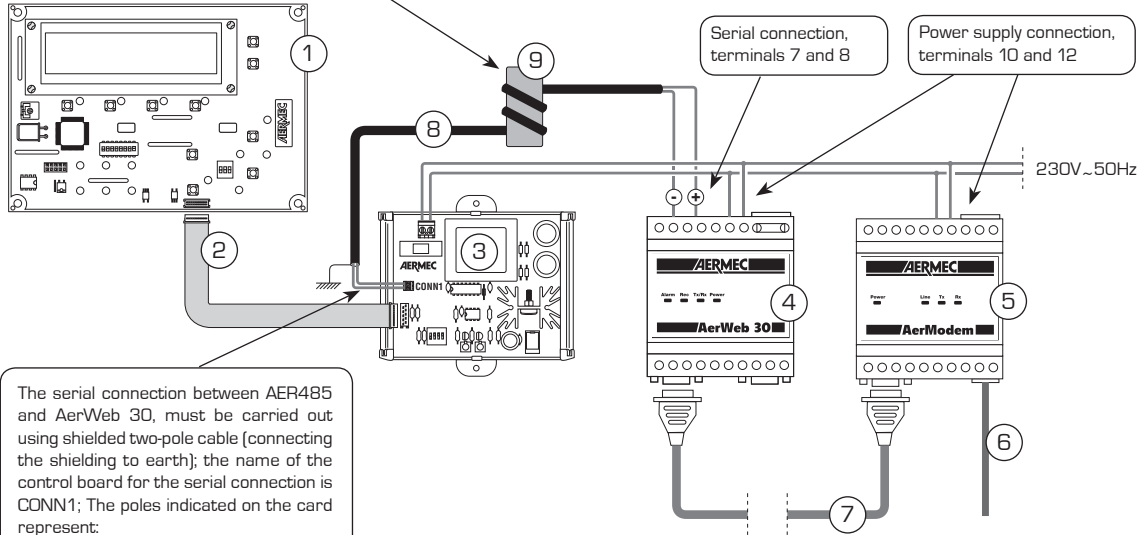
AER485 connection with GRO3, AerWeb30 and AerModem

The supplied ferrite must be introduced onto the serial connection cable, positioning it close to the AER485 card. The installation of the ferrite must be carried out by twisting the cable around the ferrite two times.

Key

- 1 - GRO3 card
- 2 - 10-way flexible flat cable
- 3 AER485 card
- 4 - AerWeb 30
- 5 - AerModem

- 6 - Telephone cable
- 7 - RS485 serial connection
- 8 - Serial connection
- 9 - Ferrite



The serial connection between AER485 and AerWeb 30, must be carried out using shielded two-pole cable (connecting the shielding to earth); the name of the control board for the serial connection is CONN1; The poles indicated on the card represent:
Pole A = POSITIVE POLE;
Pole B = NEGATIVE POLE;

AER485 connection with GRO3, AerWeb30 and AerModem GSM

Key

- 1 - GRO3 card
- 2 - 10-way flexible flat cable
- 3 AER485 card

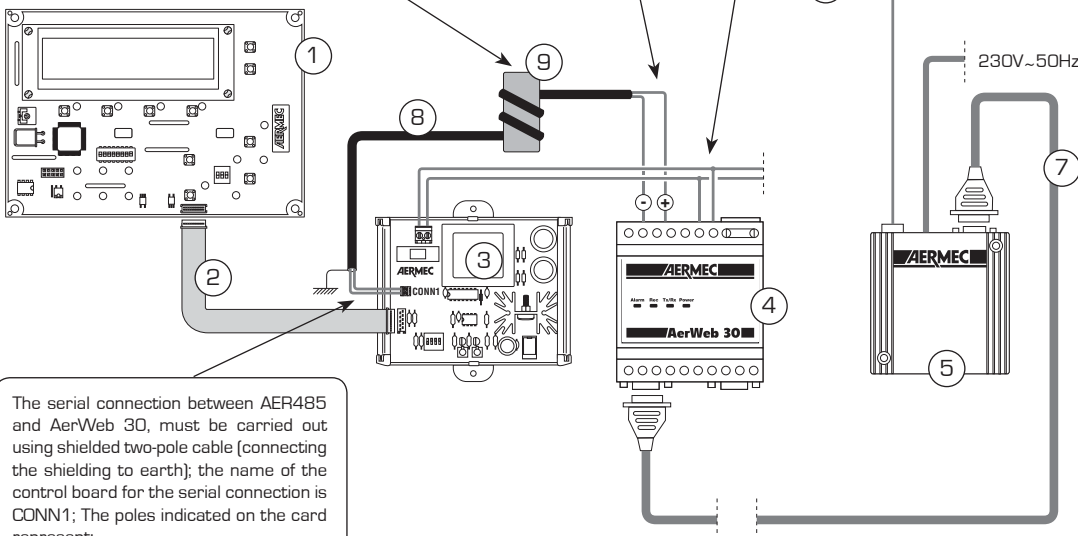
- 4 - AerWeb 30
- 5 - AerModem GSM
- 6 - Antenna GSM with cable

- 7 - RS485 serial connection
- 8 - Serial connection
- 9 - Ferrite

The supplied ferrite must be introduced onto the serial connection cable, positioning it close to the AER485 card. The installation of the ferrite must be carried out by twisting the cable around the ferrite two times.

Power supply connection, terminals 10 and 12

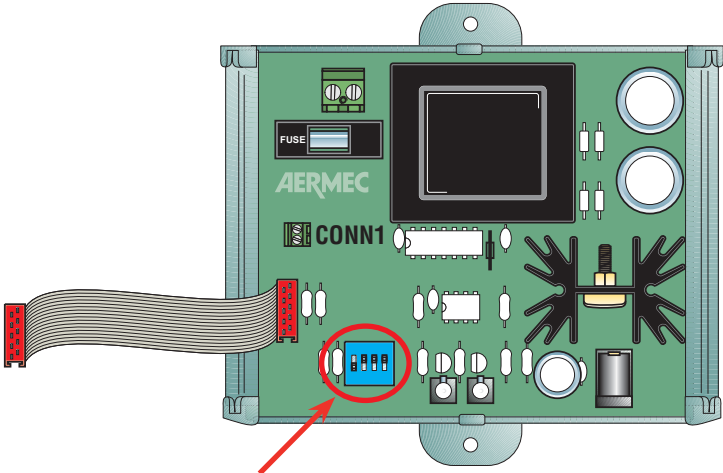
Serial connection, terminals 7 and 8





The serial connection between AER485 and AerWeb 30, must be carried out using shielded two-pole cable (connecting the shielding to earth); the name of the control board for the serial connection is CONN1; The poles indicated on the card represent:
Pole A = POSITIVE POLE;
Pole B = NEGATIVE POLE;

AER485 Dip Switch setting

There are 4 dip-switches on the AER485 card known as SW1. These must be suitable configured based on the display card version to which it is connected.



DIP-SWITCH (Display version)

<p>For display card with code 3381750 IM00 or HIGHER IM or 3399950 IM00 or HIGHER IM:</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 10px;"> <p>ON OFF</p> </div> </div>	<p>For display card with code 3279650 IM04 or LOWER IM:</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 10px;"> <p>ON OFF</p> </div> </div>
---	---

Each display card has an address, and this address must be different from the address of any other card connected to the same network. The address range varies from 1 to 255.

The translation from address value to Dip setting is shown in the conversion table. The figures from left to right respectively correspond to the Dips from position 1 to position 8.

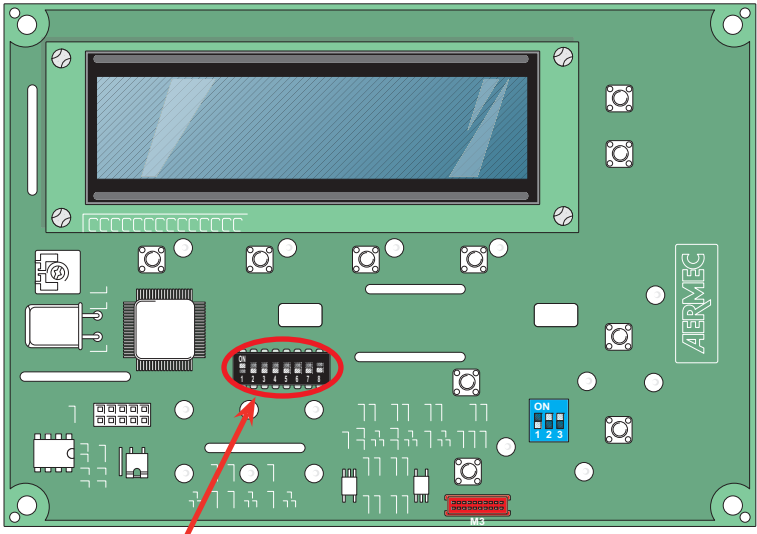
The DIP switches have the following value, according to their position:

- DIP ON = 0
- DIP OFF = 1

NB To set the address, you need to refer to the binary numeration system. DIP switch number one has a weight of 20, which is 1, while DIP switch number 8 has a weight of 27, which is 128.

To calculate the address, add together all the weights of DIP switches set to OFF.

Example: DIP switches 3, 6, and 7 are set to OFF, while the others are set to ON. The address value is as follows:
 $4+32+64=100$



DIP-SWITCH (Unit address)

Address conversion from decimal to binary

Default	Binary address	Default	Binary address	Default	Binary address	Default	Binary address	Default	Binary address
0	00000000	44	00101100	88	01011000	132	10000100	176	10110000
1	00000001	45	00101101	89	01011001	133	10000101	177	10110001
2	00000010	46	00101110	90	01011010	134	10000110	178	10110010
3	00000011	47	00101111	91	01011011	135	10000111	179	10110011
4	00000100	48	00110000	92	01011100	136	10001000	180	10110100
5	00000101	49	00110001	93	01011101	137	10001001	181	10110101
6	00000110	50	00110010	94	01011110	138	10001010	182	10110110
7	00000111	51	00110011	95	01011111	139	10001011	183	10110111
8	00001000	52	00110100	96	01100000	140	10001100	184	10111000
9	00001001	53	00110101	97	01100001	141	10001101	185	10111001
10	00001010	54	00110110	98	01100010	142	10001110	186	10111010
11	00001011	55	00110111	99	01100011	143	10001111	187	10111011
12	00001100	56	00111000	100	01100100	144	10010000	188	10111100
13	00001101	57	00111001	101	01100101	145	10010001	189	10111101
14	00001110	58	00111010	102	01100110	146	10010010	190	10111110
15	00001111	59	00111011	103	01100111	147	10010011	191	10111111
16	00010000	60	00111100	104	01101000	148	10010100	192	11000000
17	00010001	61	00111101	105	01101001	149	10010101	193	11000001
18	00010010	62	00111110	106	01101010	150	10010110	194	11000010
19	00010011	63	00111111	107	01101011	151	10010111	195	11000011
20	00010100	64	01000000	108	01101100	152	10011000	196	11000100
21	00010101	65	01000001	109	01101101	153	10011001	197	11000101
22	00010110	66	01000010	110	01101110	154	10011010	198	11000110
23	00010111	67	01000011	111	01101111	155	10011011	199	11000111
24	00011000	68	01000100	112	01110000	156	10011100	200	11001000
25	00011001	69	01000101	113	01110001	157	10011101	201	11001001
26	00011010	70	01000110	114	01110010	158	10011110	202	11001010
27	00011011	71	01000111	115	01110011	159	10011111	203	11001011
28	00011100	72	01001000	116	01110100	160	10100000	204	11001100
29	00011101	73	01001001	117	01110101	161	10100001	205	11001101
30	00011110	74	01001010	118	01110110	162	10100010	206	11001110
31	00011111	75	01001011	119	01110111	163	10100011	207	11001111
32	00100000	76	01001100	120	01111000	164	10100100	208	11010000
33	00100001	77	01001101	121	01111001	165	10100101	209	11010001
34	00100010	78	01001110	122	01111010	166	10100110	210	11010010
35	00100011	79	01001111	123	01111011	167	10100111	211	11010011
36	00100100	80	01010000	124	01111100	168	10101000	212	11010100
37	00100101	81	01010001	125	01111101	169	10101001	213	11010101
38	00100110	82	01010010	126	01111110	170	10101010	214	11010110
39	00100111	83	01010011	127	01111111	171	10101011	215	11010111
40	00101000	84	01010100	128	10000000	172	10101100	216	11011000
41	00101001	85	01010101	129	10000001	173	10101101	217	11011001
42	00101010	86	01010110	130	10000010	174	10101110	218	11011010
43	00101011	87	01010111	131	10000011	175	10101111	219	11011011

Addresses table for BMS implementation

REFERENCE GUIDE FOR MODBUS RTU PROTOCOL

The Modbus communication protocol is the communication standard made available by Aermec for the connection between machines of the chiller series and centralised supervision or control systems (see the Aermec products guide to see on which machine this protocol is available).

The protocol allows both the point to point connection (machine * supervisor), as well as several machines (max 255) on the same bus link to a supervisor, because it manages one address for each machine.

The system uses a master-slave communication mode, therefore the supervision system is master and the machine slave. This means that the machine only responds to the enquiry made by the supervisor.

9600 baud
1 start bit
no parity
1 stop bits

SERIAL CONFIGURATION:

Below are the addresses foreseen by the protocol and the corresponding meaning in terms of the machine. **The addresses that are not listed are reserved or not used and therefore commands related to addresses that are not listed cannot**

be used as this could lead to the malfunction or breakage of the machine.

Table DIGITAL READ (Code 01)

ID	Data description	ID	Data description
0	Standby/On command (toggle) 0=OFF 1=ON	17	Circuit 1 oil pressure switch alarm
1	Cooling/Heating mode command (toggle) 0=COLD 1=HOT	18	Probe alarm circuit 1
2	Safety reset command 1=RESET	19	Circuit 2 compressor heating alarm
3	Local/remote command (toggle) 0=LOCAL 1=REMOTE	20	Low circuit 2 pressure alarm
4	Defrosting status, circuit 1	21	High circuit 2 pressure alarm
5	Defrosting status, circuit 2	22	Circuit 2 antifreeze alarm
6	Circuit 1 alarm summary condition	23	Circuit 2 fan heating alarm
7	Circuit 2 alarm summary condition	24	Circuit 2 oil pressure switch alarm
8	Flow switch alarm	25	Probe alarm circuit 2
9	Condenser pump heating alarm	26	Voltage monitor alarm
10	Evaporator pump heating alarm	27	Circuit 1 pumpdown alarm
11	Efficiency alarm	28	Circuit 2 pumpdown alarm
12	Circuit 1 compressor heating alarm	29	Eprom alarm
13	Low circuit 1 pressure alarm	30	Clock calendar alarm
14	High circuit 1 pressure alarm	31	Evaporator pump load
15	Circuit 1 antifreeze alarm	32	Pressure bypass valve load
16	Circuit 1 fan heating alarm	33	Condenser pump load
		34	Circuit 1 compressor load

Table DIGITAL READ (Code 01)

ID	Data description	ID	Data description
35	Circuit 1 capacity control valve load	52	Circuit 1 VB heat recovery unit valve load
36	Circuit 1 inversion load	53	Circuit 1 VR heat recovery unit valve load
37	Circuit 1 bypass valve load	54	Circuit 2 VB heat recovery unit valve load
38	Circuit 1 fan load	55	Circuit 2 VR heat recovery unit valve load
39	Circuit 1 exchanger heater load	56	Integration 1 resistance load
40	Circuit 1 liquid valve load	57	Integration 2 resistance load
41	Circuit 1 secondary compressor load	58	Integration 3 resistance load
42	Circuit 2 compressor load	59	Evaporator pump 2 load
43	Circuit 2 capacity control valve load	60	Evaporator pump 3 load
44	Circuit 2 inversion load	80	Heat recovery unit flow switch alarm
45	Circuit 2 bypass valve load	81	Circuit 1A compressor heating alarm
46	Circuit 2 fan load	82	Circuit 2A compressor heating alarm
47	Circuit 2 exchanger heater load	83	Evaporator pump 1 heating alarm
48	Circuit 2 liquid valve load	84	Evaporator pump 2 heating alarm
49	Circuit 2 secondary compressor load	85	Evaporator pump 3 heating alarm
50	Circuit 1 VRT heat recovery unit valve load	86	Circuit 1 evaporator antifreeze alarm
51	Circuit 2 VRT heat recovery unit valve load	87	Circuit 2 evaporator antifreeze alarm

Table DIGITAL WRITE (Code 05)

ID	Data description
0	Standby/On command (toggle) 0=OFF 1=ON
1	Cooling/Heating mode command (toggle) 0=COLD 1=HOT
2	Safety reset command 1=RESET
3	Local/remote command (toggle) 0=LOCAL 1=REMOTE

Table ANALOGUE WRITE (Code 06)

ID	Code	Data description
0	SetFreddo	Cooling mode setting
1	SetCaldo	Heating mode setting
2	Dif.Grad	Step differential setting for thermostat
3	Tot. diff.	Total differential setting per thermostat
15	S.CaldoR	Heating mode setting for managing the heat recovery unit
16	D.Grad.R	Step differential setting for thermostat managing the heat recovery unit
17	D.Tot.R	Total differential setting for thermostat managing the heat recovery unit
41	2° Set F.	Second cooling set
42	2° Set C.	second heating set

Table ANALOGUE READ (Code 03)

ID	Code	Data description
0	SetFreddo	Cooling mode setting
1	SetCaldo	Heating mode setting
2	Dif.Grad	Differential step setting for thermostat
3	Tot. diff.	Total differential setting per thermostat
15	S.CaldoR	Heating mode setting for managing the heat recovery unit
16	D.Grad.R	Total differential setting for thermostat managing the heat recovery unit
17	D.Tot.R	Differential step setting for thermostat managing the heat recovery unit
18	TIA	Water input temperature
19	TUA C1	Circuit 1 water outlet temperature
20	TUA C2	Circuit 2 water outlet temperature
21	TAE	Outside air temperature
22	TL C1	Liquid temperature circuit 1
23	TL C2	Liquid temperature circuit 2
24	TIAH	Condenser water inlet temperature
25	TUAH C1	Condenser water outlet temperature circuit 1
26	TUAH C2	Condenser water outlet temperature circuit 2
27	TIR	Recovery exchanger water inlet temperature
28	TUR1	Recovery exchanger water outlet temperature, circuit 1
29	TUR2	Recovery exchanger water outlet temperature, circuit 2
30	P.A.C1	High pressure, circuit 1
31	P.A.C2	High pressure, circuit 2
32	P.B.C1	Low pressure, circuit 1
33	P.B.C2	Low pressure, circuit 2
41	2° Set F.	Second cooling set
42	2° Set C.	second heating set
13	2Ore CP1	Working hours compressor circuit 1
133	Ore CP2	Working hours compressor circuit 2
142	Timer	Select daily/weekly timer mode
169	OreCP1A	Circuit 1A compressor working hours
170	OreCP2A	Circuit 2A compressor working hours

*I dati tecnici riportati nella presente documentazione non sono impegnativi.
AERMEC S.p.A. si riserva la facoltà di apportare in qualsiasi momento tutte le modifiche ritenute necessarie per il miglioramento del prodotto.*

*Technical data shown in this booklet are not binding.
AERMEC S.p.A. shall have the right to introduce at any time whatever modifications deemed necessary to the improvement of the product.*

Les données mentionnées dans ce manuel ne constituent aucun engagement de notre part. AERMEC S.p.A. se réserve le droit de modifier à tous moments les données considérées nécessaires à l'amélioration du produit.

Im Sinne des technischen Fortschrittes behält sich AERMEC S.p.A. vor, in der Produktion Änderungen und Verbesserungen ohne Ankündigung durchzuführen.

AERMEC S.p.A. se reserva el derecho de modificarlos en cualquier momento llevado por la necesidad de mejorar el producto.

*Los datos técnicos que se reproducen en este documento no son vinculantes.
AERMEC S.p.A. se reserva el derecho de modificarlos en cualquier momento llevado por la necesidad de mejorar el producto.*

AERMEC S.p.A.

I-37040 Bevilacqua (VR) - Italia
Via Roma, 996 - Tel. (+39) 0442 633111
Telefax (+39) 0442 93566 - 0442 93730
www.aermec.com