MODULA MK

Moto-condensatore
Motor-condenser
Moto-condenseur
Moto-Kondensator
Moto-condensador

DISTRIBUTOR COOL4U Kft.

ISTRUZIONI DI MONTAGGIO, USO E MANUTENZIONE
ASSEMBLY, MAINTENANCE AND USE INSTRUCTIONS
INSTRUCTIONS POUR LE MONTAGE, L'EMPLOI ET L'ENTRETIEN
MONTAGE - UND WARTUNGSANLEITUNG
INSTRUCCIONES DE MONTAJE, USO Y MANTENIMIENTO

I	Il presente manuale, oltre alle istruzioni di montaggio e le avvertenze per l'installatore, contiene le indicazioni per l'uso e la manutenzione del prodotto; deve essere quindi conservato dall'utilizzatore.
GB	This manual contains the assembly procedures, the information for the installer and the use and maintenance instructions. We recommend the user to keep it in safe and clean place.
F	Ce manuel au delà des instructions d'assemblage et des conseils pour l'installateur, donne les indications pour l'emploi et l'entretien des produits et pourtant l'utilisateur doit le garder.
D	Dieses Handbuch enthält nicht nur die Montage-Gebrauch Anweisungen und die Anmerkungen für den Installateur, aber auch die Angaben für Gebrauch und Wartung des Produkt: es muss also vom Benutzer gehalten werden.
E	El presente manual, además de las instrucciones de montaje y de las advertencias para el instalador, contiene las indicaciones para el uso y el mantenimiento del producto, por lo tento, el usuario deberá conservarlo.

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AUTOCLIMA QUALITY & COMFORT

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MODULA

I

Il progetto **"MODULA"** è stato sviluppato per soddisfare le esigenze di chi non può o non vuole utilizzare un compressore trascinato dal motore termico del veicolo. **È sufficiente avere a disposizione un'alimentazione elettrica a 12V / 24V / 80V oppure un'alimentazione di tipo idraulico.**

È modulabile poichè è possibile scegliere fra più combinazioni: gruppo completo, **gruppo motocondensante** o gruppo motocompressore; di conseguenza il posizionamento dei componenti è il più svariato e flessibile anche grazie alla possibilità di abbinare evaporatori e/o condensatori differenti.

Ecco quindi che il campo di applicazione è vasto: **veicoli speciali di vario genere, elettrici, ibridi, agricoli, movimento terra, gru, cabine, ...**

Gruppo motocondensante

Il **gruppo motocondensante** può essere scelto da chi per motivi di spazio non può utilizzare il gruppo completo.

Il gruppo racchiude in sè il compressore e il condensatore più un motore elettrico o idraulico.

Lo si può collocare nella posizione più favorevole all'applicazione specifica e si può abbinare ad un evaporatore a scelta fra quelli consigliati in base alle esigenze.

GB

The **"MODULA"** project was designed to meet the needs of those people who cannot or do not want to use a compressor driven by the vehicle's thermal motor. **All that is required is to have a 12V / 24V / 80V electric power outlet or a hydraulic power feed.**

It is modular since it is possible to choose among various combinations: complete assembly, **moto-condensing assembly** or moto-compressor assembly; the positioning of these components is, therefore, diversified and flexible, also thanks to the possibility of coupling different evaporators and/or condensers.

The field of applications widens considerably: **various types of special vehicles, electrical, hybrid, farming, earth-moving, cranes, cabins, ...**

Motor-condensing unit

People can chose the **motor-condensing** unit when, for reasons of space, the complete unit cannot be used.

The group embodies the compressor and the condenser plus an electric or hydraulic motor.

It can be placed in the best position for the specific application and can be combined to one of the suggested evaporators, depending from individual needs.

F

Le projet **"MODULA"** a été développé pour répondre aux exigences de ceux qui ne peuvent pas ou ne veulent pas utiliser un compresseur entrainé par le moteur thermique du véhicule. **Il suffit d'avoir à disposition une alimentation électrique à 12V / 24V / 80V ou une alimentation de type hydraulique.**

Il est modulable car il est possible de choisir parmi plusieurs combinaisons: groupe complet, **groupe moto-condensant** ou groupe moto-compresseur; par conséquent le positionnement des composants est plus varié et flexible également grâce à la possibilité d'associer des évaporateurs et/ou des condenseurs différents.

Par conséquent le champ d'application est vaste: **des véhicules spéciaux en tout genre, électriques, hybrides, agricoles, terrassement, grue, cabines, ...**

Groupe moto-condenseur

On peut choisir l'unité **moto-condenseur** quand, pour des raisons d'espace, on ne peut pas utiliser le groupe complet.

Le groupe incorpore le compresseur et le condenseur, plus un moteur électrique ou hydraulique.

Son emplacement se fait dans l'endroit demandé par l'application spécifique et on peut le combiner avec un des évaporateurs conseillés, en fonction des besoins.

D

Die Reihe **"MODULA"** soll den Anforderungen all derer gerecht werden, die keinen vom Kühlmotor des Fahrzeuges angetriebenen Kompressor verwenden können oder wollen. **Dazu ist eine elektrische Versorgung mit 12V / 24V / 80V oder eine hydraulische Versorgung ausreichend.**

Die Reihe ist modulierbar, da zwischen mehreren Kombinationen gewählt werden kann: komplette Gruppe, **motokondensierende Gruppe** oder Motokompressorgruppe; folglich erweist sich die Positionierung der Bauteile als vielfältiger und flexibler, auch dank der Möglichkeit, verschiedene Verdampfer und/oder Kondensatoren zu verbinden.

Und daher besteht also ein umfangreiches Anwendungsgebiet: **Spezialfahrzeuge aller Art, Elektro- und Hybridfahrzeuge, landwirtschaftliche Maschinen und Baumaschinen, Kräne, Kabinen, etc. ...**

Moto-Kondensatorgruppe

Die **Moto-Kondensatorgruppe** kann aus Platzgründen alternativ zur komplette Einheit verwendet werden.

Die Gruppe enthält den Kompressor und den Kondensator sowie zusätzlich einen Elektro-oder einen Hydraulikmotor.

Sie kann an geeigneter Stelle untergebracht und mit einem der je nach Bedarf empfohlenen Verdampfer kombiniert werden.

E

El Proyecto **"MODULA"** ha sido creado para satisfacer las exigencias de quien no puede o no desea utilizar un compresor accionado por el motor térmico del vehículo. **Sólo se necesita disponer de una alimentación eléctrica de 12V / 24V / 80V o bien una alimentación de tipo hidráulico.**

Es modular ya que se puede escoger entre varias combinaciones: grupo completo, **grupo motocondensador** o grupo motocompresor; lo que comporta gran variedad y flexibilidad en la colocación de los componentes, también gracias a la posibilidad de combinar evaporadores y/o condensadores distintos.

Por ello, el campo de aplicación es muy amplio: **vehículos especiales de distintos tipos, eléctricos, híbridos, agrícolas, movimiento de tierra, grúas, cabinas, ...**

Grupo moto-condensador

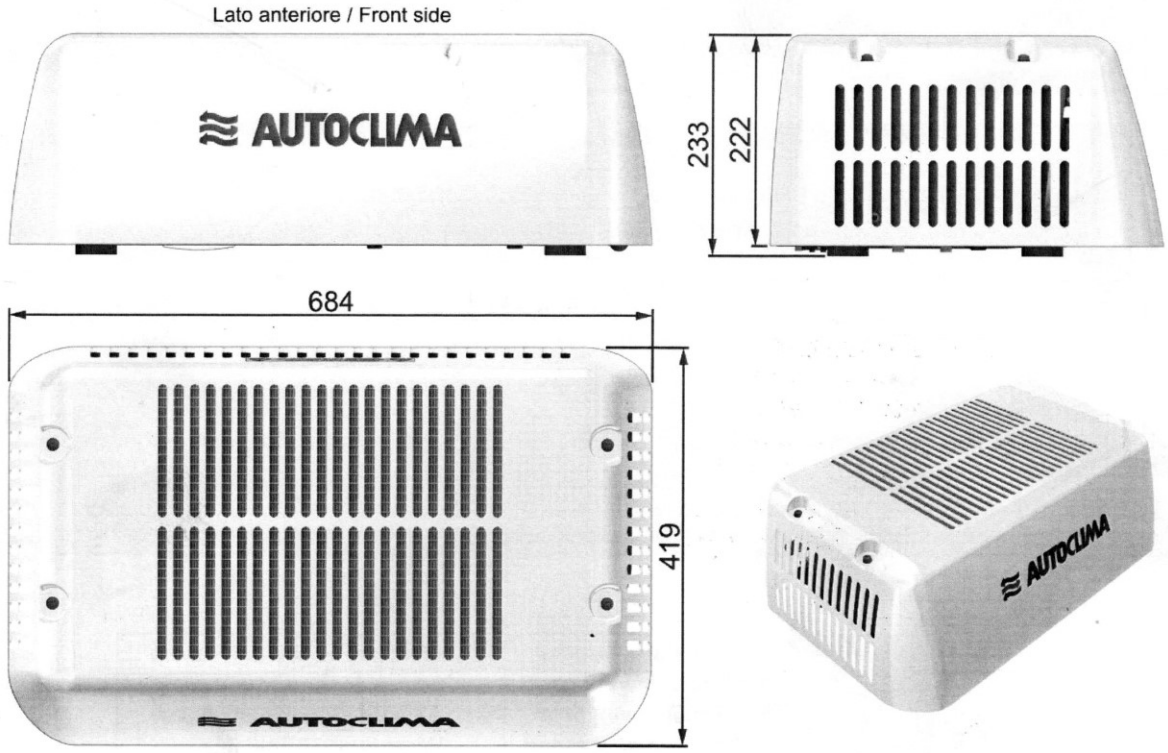
Quien por motivos de espacio no puede utilizar el grupo completo puede elegir el **grupo moto-condensador**.

El grupo comprende el compresor y el condensador además de un motor eléctrico o hidráulico.

Puede ser colocado en la posición más favorable para cada aplicación específica y puede combinarse con un evaporador que puede ser elegido entre aquellos aconsejados en base a las necesidades.

Codice **Code** **Code** **Kode** **Còdigo**	**Tensione veicolo** **Vehicle voltage** **Tension véhicule** **Spannung Fahrzeug** **Tensiòn vehìculo**	**Alimentazione condizionatore** **Air conditioner power supply** **Alimentation climatiseur** **Versorgung Klimaanlage** **Alimentación acondicionador**
30301247	12 V	Alimentazione elettrica Electrical power supply Alimentation électrique Elektrische Stromversorgung Alimentación eléctrica
30301248	24 V	
30301270	80 V – 24 V	
30301249	12 V	Alimentazione idraulica Hydraulic power supply Alimentation hydraulique Hydraulik versorgung Alimentación hidràulica
30301252	24 V	

DIMENSIONI
DIMENSIONS
DIMENSIONS
DIMENSIONEN
DIMENSIONES



AUTOCLIMA QUALITY & COMFORT

MODULA

CARATTERISTICHE TECNICHE
TECHNICAL DATA
DONNES TECHNIQUES
TECHNISCHEN EIGENHEITEN
CARACTERÍSTICAS TÉCNICAS

Potenza frigorifera evaporatore abbinabile	Cooling capacity of matching evaporator	Puissance frigorifique evaporateur correspondant	Verdampfer Kühlleistung kombiniert	Potencia frigorifica del evaporador combinado	**max 4 kW**
Alimentazione evaporatore abbinabile	Power supply of matching evaporator	Alimentation evaporateur correspondant	Verdampfer Versorgung kombiniert	Alimentación del evaporador combinado	**(Modula MK 12 VDC) → 12 VDC** **(Modula MK 24 VDC) → 24 VDC** **(Modula MK 80 VDC - 24 VDC) → 24 VDC**

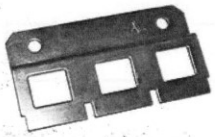
MODULA MK

Alimentazione		Power supply		Alimentation		Versorgung		Alimentación		**elettrica / electrical / électrique / elektrische / eléctrica:** **(12 VDC) / (24 VDC) / (80 VDC - 24 VDC)**
										idraulica / hydraulic / hydraulique / hydraulik / hidràulica: **(12 VDC) / (24 VDC)**
Assorbimento elettrico	alimentaz. elettrica	Power consumption	electrical power supply	Absorption électrique	alimentation électrique	Stromverbrauch	Versorgung elektrische	Intensidad absorbida	alimentación eléctrica	**(70 A@12VDC) / (35 A@24VDC) /** **(10 A@80VDC – 4,5 A@24VDC)**
	alimentaz. idraulica		hydraulic power supply		alimentation hydraulique		Versorgung hydraulik		alimentación hidràulica	**(14 A@12VDC) / (7 A@24VDC)**
Dimensione attacchi refrigerante IN - OUT		IN - OUT coolant fitting dimensions		Dimension raccords réfrigérant IN - OUT		IN - OUT Anschlussgröße der Kühlmittel		Dimensiones de conexión refrigerante IN - OUT		**(IN) 7/8" – 14 UNF 2A** **(OUT) 5/8" – 18 UNF 2A**
Lunghezza massima dei tubi refrigerante		Maximum length coolant hoses		Longueur maximale de tuyaux de réfrigérant		Maximale Länge der Kältemittelrohre		Longitud máx. de tuberías de refrigerante		**5 m**
Refrigerante		Coolant		Réfrigérant		Kühlmittel		Refrigerante		**R134a**
Carica massima di refrigerante		Maximum charge of coolant		Charge maximale de réfrigérant		Maximale Kältemittelfüllung		Carga máxima de refrigerante		**500 g**
Peso		Weight		Poids		Gewicht		Peso		**30 kg**
Olio compressore		Compressor oil		Huile compresseur		Kompressoröl		Aceite compresor		**PAG 150 46**

Motore idraulico	**Hydraulic motor**	**Moteur hydraulique**	**Hydraulikmotor**	**Motor hidràulico**	
Cilindrata (cm^3/giro)	Displacement (cm^3/spin)	Déplacement (cm^3/tour)	Hubraum (cm^3/Runde)	Desplazamiento (cm^3/vuelta)	**11,23**
Fluido di lavoro	Working fluid	Fluide de travail	Arbeitsfluid	Fluido de trabajo	**Olio idraulico / Hydraulic oil / Huile hydraulique / Hydrauliköl / Aceite hidràulico**
Dimensione attacchi IN - OUT - DRAIN	IN - OUT - DRAIN fitting dimensions	Dimension raccords IN - OUT - DRAIN	IN - OUT - DRAIN Anschlussmaße	Dimensiones de conexión DRENAJE - IN - OUT	**1/2"G - 1/2"G - 1/4"G**
Portata fluido idraulico	Hydraulic fluid capacity	Débit du fluide hydraulique	Hydraulikfluidkapazität	Capacidad de fluido hidráulico	**15 - 25 dm^3/min**
Pressione fluido idraulico	Hydraulic fluid pressure	Pression du fluide hydraulique	Hydraulikflüssigkeitsdruck	Presión del fluido hidráulico	**100 - 150 bar**
Temperatura fluido idraulico	Hydraulic fluid temperature	Température du fluide hydraulique	Hydraulikflüssigkeitstemperatur	Temperatura del fluido hidráulico	**-25° C ÷ +80° C**
Valvola di sicurezza integrata	Integrated safety valve	Soupape de sécurité intégrée	Integrierte Sicherheitsventil	Válvula de seguridad integrada	**150 bar**

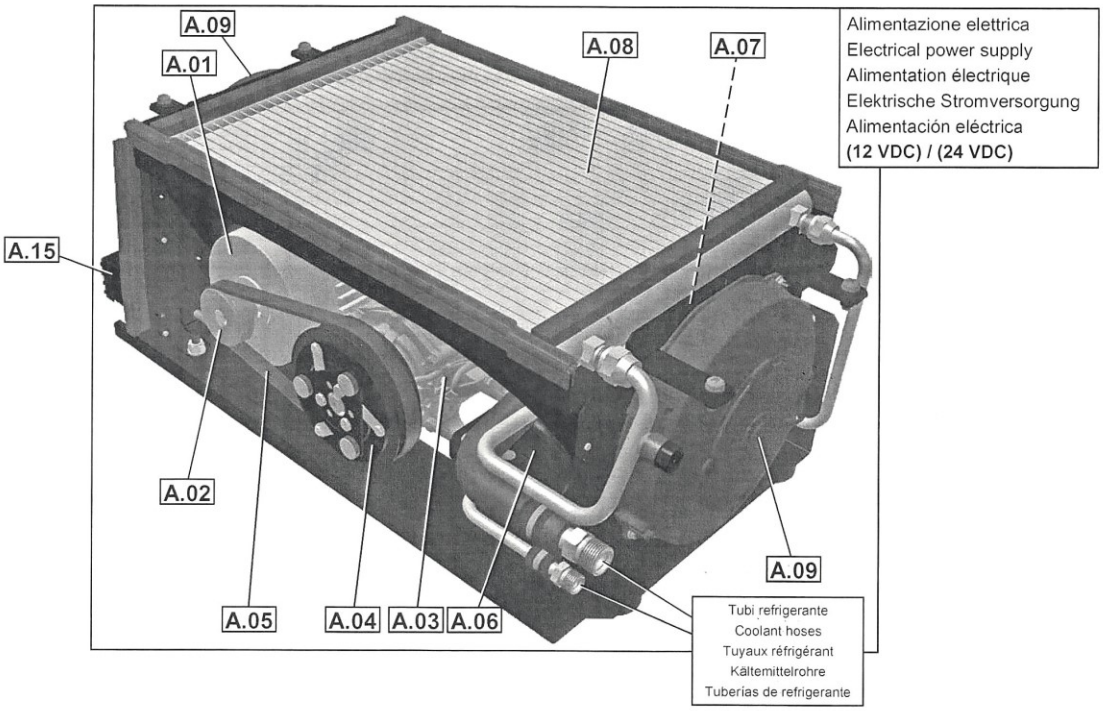
Volume minimo del serbatoio del fluido idraulico:	Minimum tank volume of hydraulic fluid:	Le volume minimal du réservoir de fluide:	Tankmindestvolumen:	Volumen mínimo del tanque de fluido:
almeno il triplo dell'olio presente nel circuito.	at least three times the volume of the oil inside the circuit.	au moins trois fois l'huile dans le circuit.	mindestens das Dreifache der im Kühlkreis enthaltenen Menge.	al menos tres veces el aceite en el circuito.

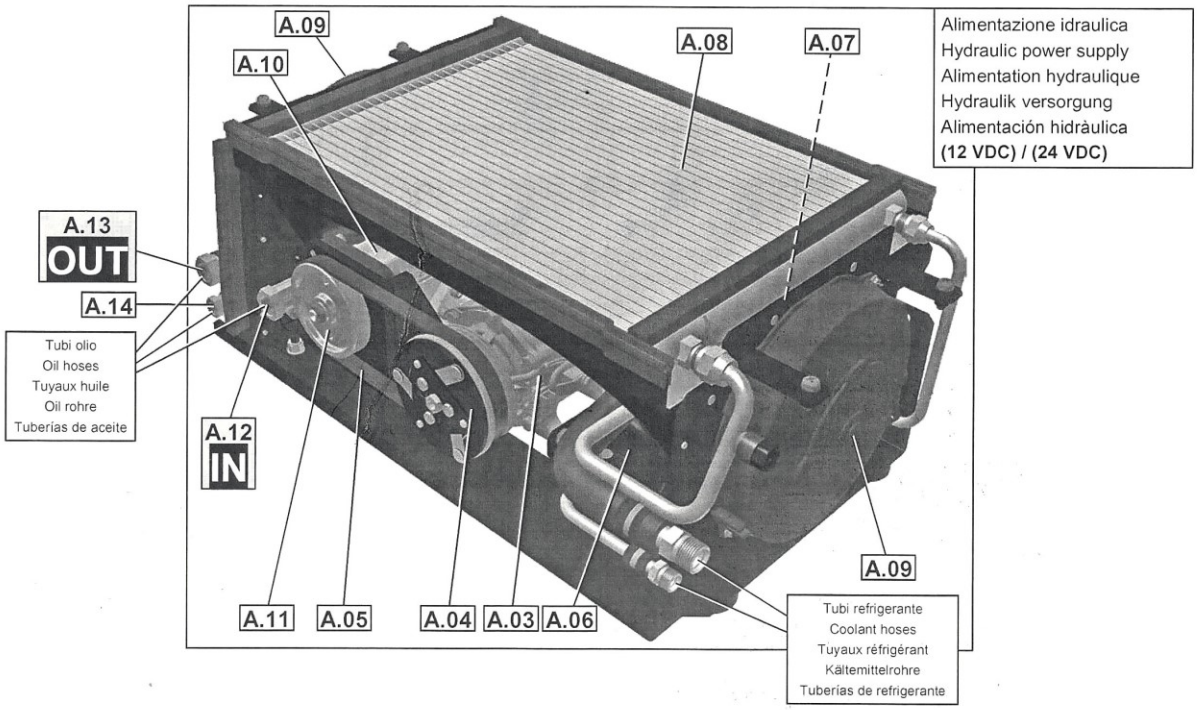
COMPONENTI FORNITI
COMPONENTS SUPPLIED
COMPOSANTS FOURNIS
GELIEFERTE BAUTEILE
COMPONENTES SUMINISTRADOS

DESCRIZIONE **DESCRIPTION** **NOMENCLATURE** **BEZEICHNUNG** **DENOMINACION**	**RIF.** **REF.** **RÉF.** **BEZ.** **REF.**	**Q.TÁ** **Q.TY** **Q.TÈ** **M.GE** **C.DAD**	**IMMAGINE / FUNZIONE** **IMAGE / TASK** **IMAGE / TACHE** **BILD** / AUFGABE **IMAGEN** / TAREA
Moto-condensatore Motor-condenser Moto-condenseur Moto-Kondensator Moto-condensador	**A**	1	
Vite con testa cilindrica M6x25 Cilyndrical head screw M6x25 Vis à tête cylindrique M6x25 Schraube mit Zylinderkopf Tornillo con cabeza cilíndrica	**AA**	4	**Per il fissaggio della copertura** **For fastening the cover** **Pour la fixation du couverture** **Zur Befestigung der Abdeckung** **Para la fijación de la cobertura**
Rondella elastica Ø6 Spring washer Ø6 Rondelle élastique Ø6 Federscheibe Ø6 Arandela elástica Ø6	**BB**	4	
Rondella piana Ø6 Plain washer Ø6 Rondelle plate Ø6 Unterlegscheibe Ø6 Arandela plana Ø6	**CC**	4	
Rondella in gomma Ø6 Rubber washer Ø6 Rondelle en caoutchouc Ø6 Gummischeibe Ø6 Arandela de goma Ø6	**DD**	4	
Staffetta porta relè **(NO versioni elettriche 80V-24V)** Relay support bracket **(NO for electric models 80V-24V)** Patte de support relais **(NO pour les modèles électriques 80V-24V)** Relaishaltebügel **(NEIN für elektrische Modelle 80V-24V)** Abrazadera de soporte relé **(NO para los modelos eléctricos 80V-24V)**	**B**	1	
Rivetto **(NO versioni elettriche 80V-24V)** Rivet **(NO for electric models 80V-24V)** Rivet **(NO pour les modèles électriques 80V-24V)** Niet **(NEIN für elektrische Modelle 80V-24V)** Remache **(NO para los modelos eléctricos 80V-24V)**	**EE**	2	**Per il fissaggio della staffetta porta relè** **For fastening the relay support bracket** **Pour la fixation du patte de support relais** **Zur Befestigung der Relaishaltebügel** **Para la fijación de la abrazadera de soporte relé**
Distanziale in gomma Ø44 Rubber spacer Ø44 Entretoise en caoutchouc Ø44 Distanzgummi Ø44 Distanciador de goma Ø44	**C**	4	

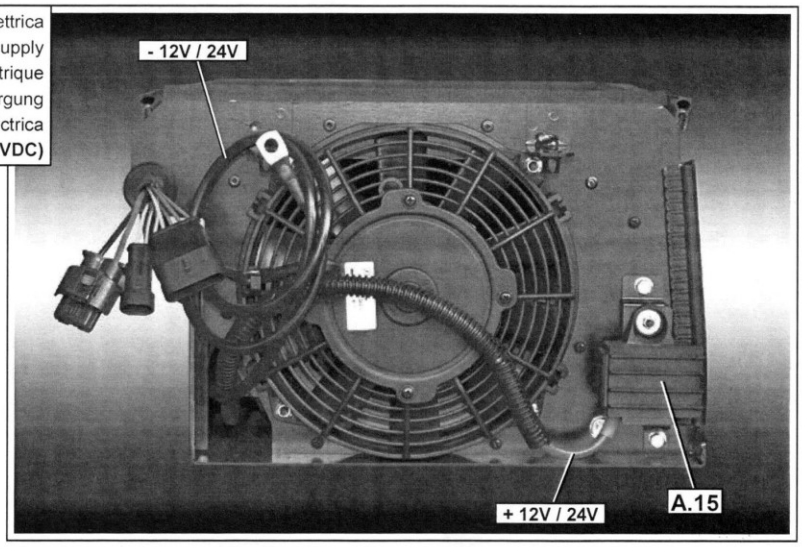
DESCRIZIONE DESCRIPTION NOMENCLATURE BEZEICHNUNG DENOMINACION	RIF. REF. RÉF. BEZ. REF.	Q.TÁ Q.TY Q.TÈ M.GE C.DAD	IMMAGINE / FUNZIONE IMAGE / TASK IMAGE / TACHE BILD / AUFGABE IMAGEN / TAREA
Cablaggio di alimentazione **(per versioni elettriche)** Power supply wiring **(for electric models)** Câblage d'alimentation **(pour les modèles électriques)** Stromversorgungskabelbaum **(für elektrische Modelle)** Cableado de alimentación **(para los modelos eléctricos)**	D	1	-
Cablaggio di alimentazione **(per versioni idrauliche)** Power supply wiring **(for hydraulic models)** Câblage d'alimentation **(pour les modèles hydrauliques)** Stromversorgungskabelbaum **(Für hydraulischen Modelle)** Cableado de alimentación **(para los modelos hidráulicos)**	E		-
Cablaggio relè e fusibili **(NO versioni elettriche 80V-24V)** Relais and fuses wiring **(NO for electric models 80V-24V)** Câblage relais et fusibles **(NO pour les modèles électriques 80V-24V)** Verdrahtung Relais und Sicherungen **(NEIN für elektrische Modelle 80V-24V)** Cableado relés y fusibles **(NO para los modelos eléctricos 80V-24V)**	F	1	-
Scatola elettrica **(versioni elettriche 80V-24V)** Electrical box **(for electric models 80V-24V)** Boîte électrique **(pour les modèles électriques 80V-24V)** Elektrokasten **(für elektrische Modelle 80V-24V)** Caja eléctrica **(para los modelos eléctricos 80V-24V)**	G		
Led Led Led Led Led	H	1	

COMPONENTI PRINCIPALI
MAIN COMPONENTS
COMPOSANTS PRINCIPAUX
HAUPTKOMPONENTEN
COMPONENTES PRINCIPALES

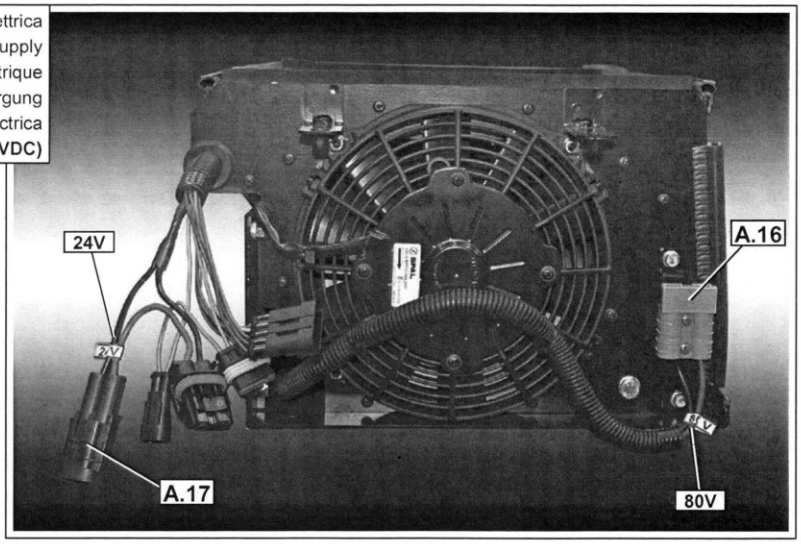




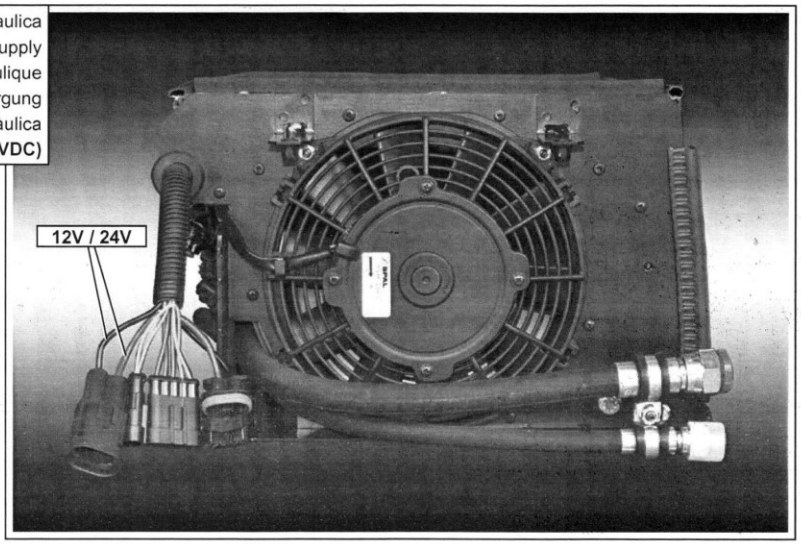
Alimentazione elettrica
Electrical power supply
Alimentation électrique
Elektrische Stromversorgung
Alimentación eléctrica
(12 VDC) / (24 VDC)



Alimentazione elettrica
Electrical power supply
Alimentation électrique
Elektrische Stromversorgung
Alimentación eléctrica
(80 VDC - 24 VDC)



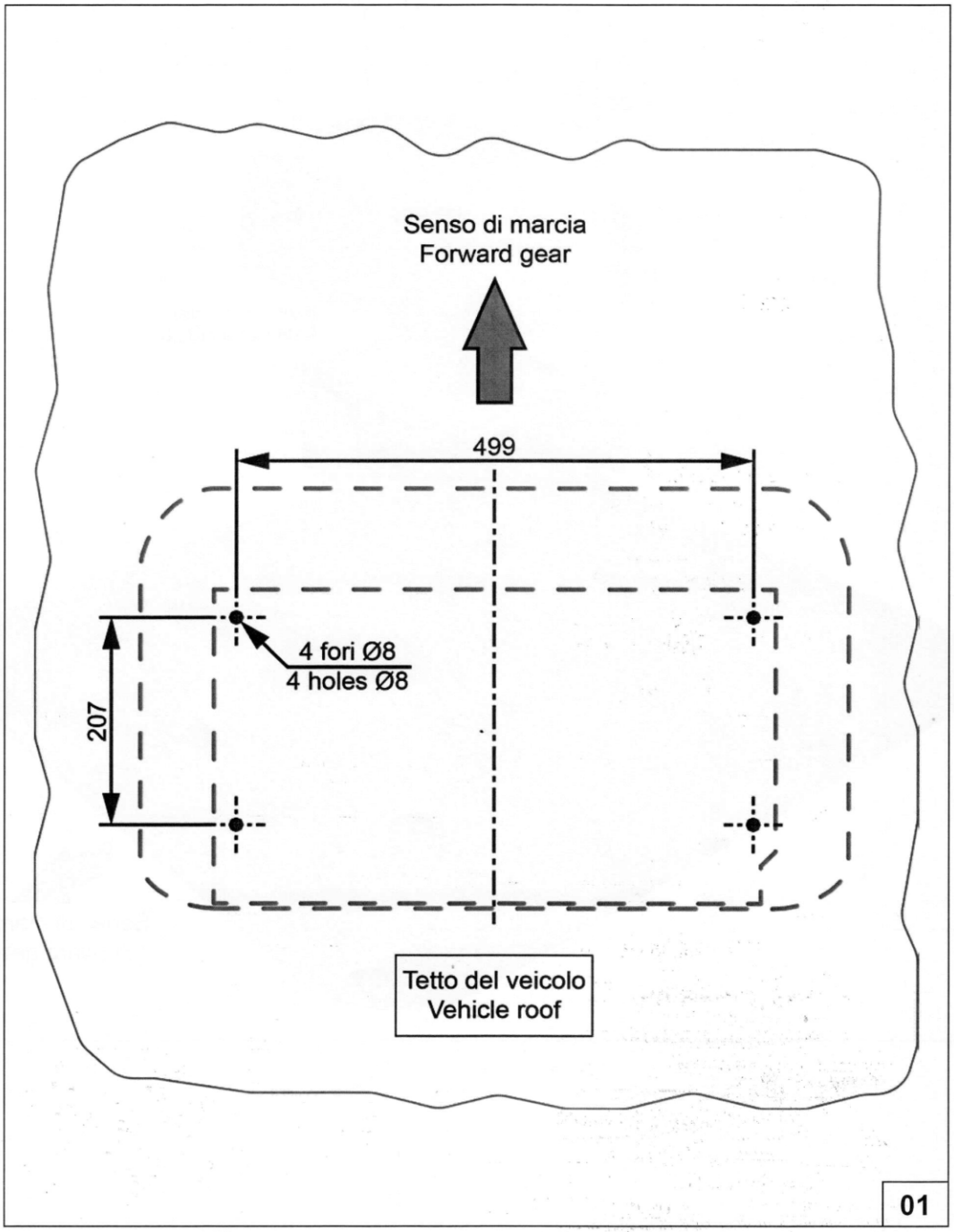
Alimentazione idraulica
Hydraulic power supply
Alimentation hydraulique
Hydraulik versorgung
Alimentación hidràulica
(12 VDC) / (24 VDC)

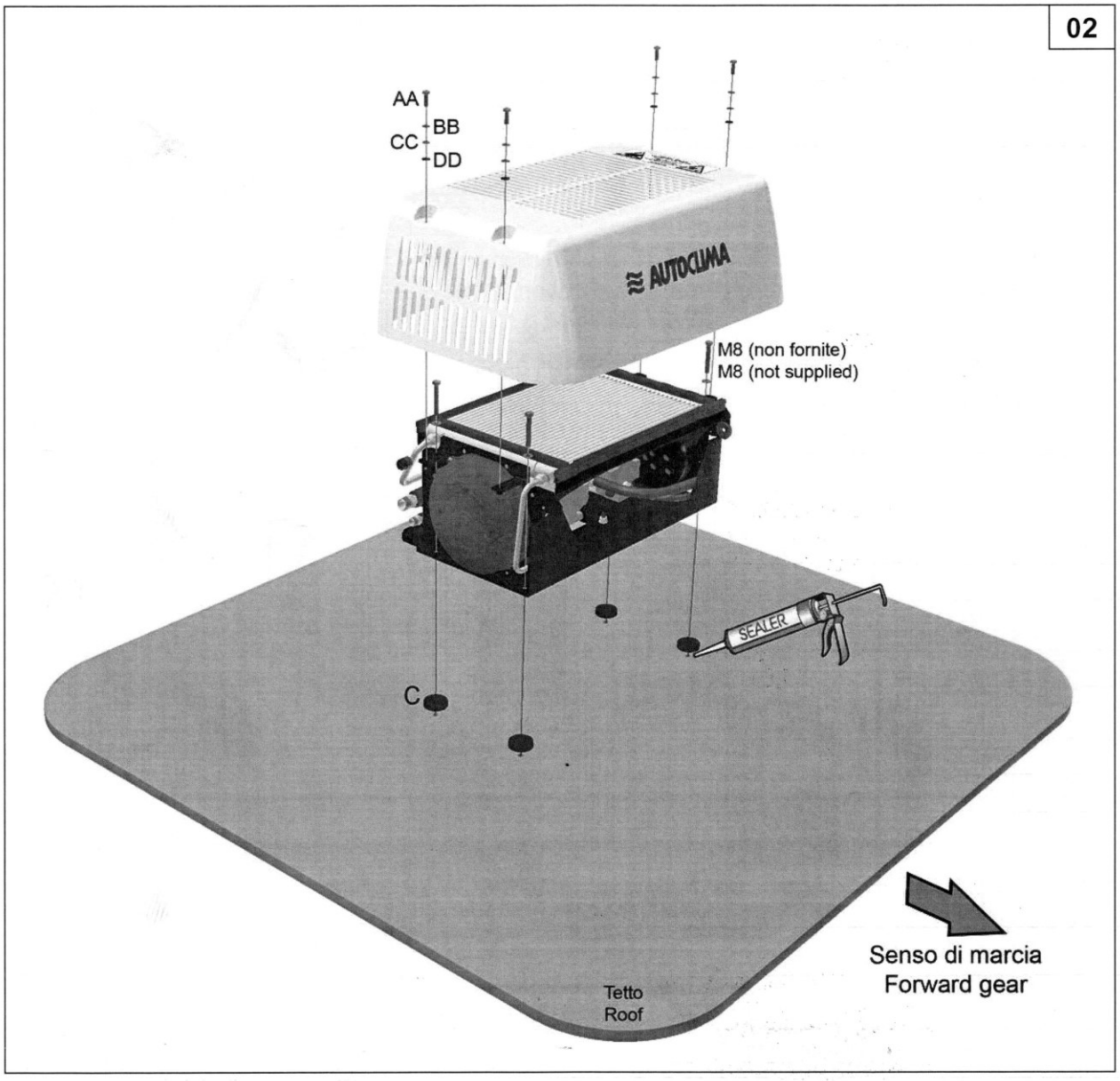


DESCRIZIONE DESCRIPTION NOMENCLATURE BEZEICHNUNG DENOMINACION	Q.TÁ Q.TY Q.TÈ M.GE C.DAD	RIF. REF. RÉF. BEZ. REF.
Motore elettrico Electric motor Moteur électrique Elektromotor Motor eléctrico	1	**A.01**
Puleggia per motore elettrico Electric motor pulley Poulie pour moteur électrique Riemenscheibe für den Elektromotor Polea por motor eléctrico	1	**A.02**
Compressore Compressor Compresseur Kompressor Compresor	1	**A.03**
Puleggia per compressore Compressor pulley Poulie pour compresseur Riemenscheibe für den Kompressor Polea por compresor	1	**A.04**
Cinghia Belt Courroie Riemen Correa	1	**A.05**
Filtro deidratore Dehydration filter Filtre déshydrateur Filtertrockner Filtro deshidratador	1	**A.06**
Pressostato Pressure switch Pressostat Druckschalter Presóstato	1	**A.07**
Condensatore Condenser Condenseur Kondensator Condensador	1	**A.08**
Elettroventola condensatore Condenser electric fan Ventilateur électrique du condenseur Elektrischer Kondensator Ventilator Ventilador eléctrico del condensador	2	**A.09**

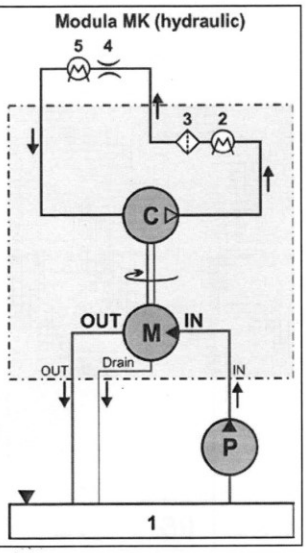
DESCRIZIONE DESCRIPTION NOMENCLATURE BEZEICHNUNG DENOMINACION	Q.TÁ Q.TY Q.TÈ M.GE C.DAD	RIF. REF. RÉF. BEZ. REF.
Motore idraulico Hydraulic motor Moteur hydraulique Hydraulikmotor Motor hidràulico	1	**A.10**
Puleggia per motore idraulico Hydraulic motor pulley Poulie pour moteur hydraulique Riemenscheibe für den Hydraulikmotor Polea por motor hidràulico	1	**A.11**
Tubo ingresso olio Oil inlet hose Tuyau d'entrée huile Oil einlassrohr Tubo entrada aceite	1	**A.12**
Tubo uscita olio Oil outlet hose Tuyau de sortie d'huile Oil Auslassrohr Tubo salida aceite	1	**A.13**
Tubo drenaggio olio Oil drainage hose Tuyau de drainage huile Oil Abflussrohr Tubo drenaje aceite	1	**A.14**
Nodo di derivazione Branch knot Noeud de dérivation Knot Ableitung Nudo de derivación	1	**A.15**
Connettore alimentazione 80V **(per versioni elettriche 80 VDC – 24 VDC)** Power supply connector 80V **(for electric models 80 VDC – 24 VDC)** Connecteur d'alimentation 80V **(pour les modèles électriques 80 VDC – 24 VDC)** Stromanschluss 80V **(für elektrische Modelle 80 VDC – 24 VDC)** Conector de alimentación 80V **(para los modelos eléctricos80 VDC – 24 VDC)**	1	**A.16**
Connettore alimentazione 24V **(per versioni elettriche 80 VDC – 24 VDC)** Power supply connector 24V **(for electric models 80 VDC – 24 VDC)** Connecteur d'alimentation 24V **(pour les modèles électriques 80 VDC – 24 VDC)** Stromanschluss 24V **(für elektrische Modelle 80 VDC – 24 VDC)** Conector de alimentación 24V **(para los modelos eléctricos80 VDC – 24 VDC)**	1	**A.17**

IMMAGINI
IMAGES
IMAGES
BILDER
IMÁGENES

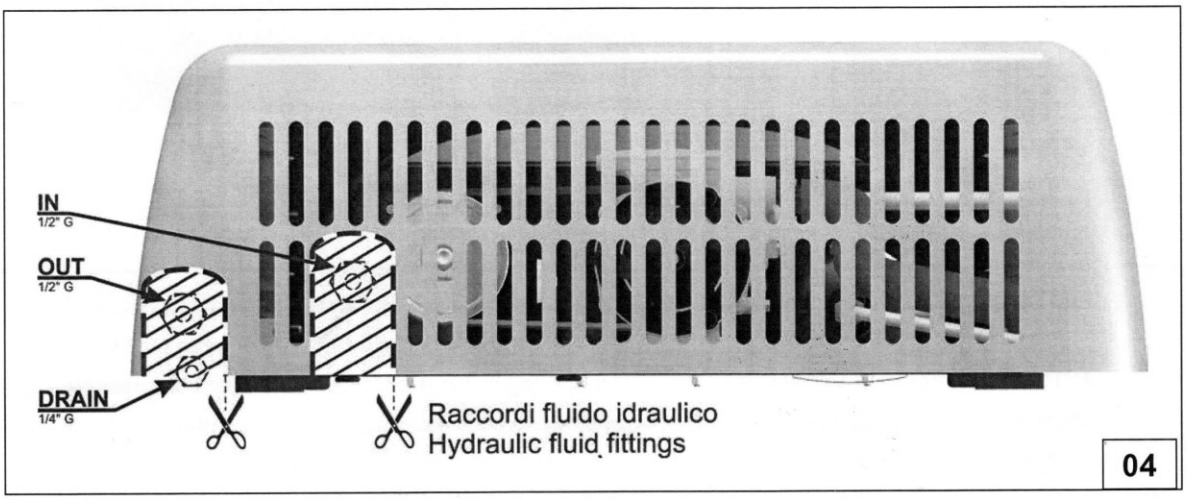



02
AA
BB
CC
DD
AUTOCLIMA
M8 (non fornite)
M8 (not supplied)
SEALER
C
Tetto
Roof
Senso di marcia
Forward gear

	Modula MK (idraulico)	Modula MK (hydraulic)	Modula MK (hydraulique)	Modula MK (Hydraulik)	Modula MK (hidraulico)
	Circuito idraulico	Hydraulic circuit	Hydraulique circuit	Hydraulischer Kühlkreis	Circuito hidraulico
1	Serbatoio	Tank	Reservoir	Tank	Tanque
2	Condensatore	Condenser	Condenseur	Kondensator	Condensador
3	Filtro deidratore	Receiver drier	Filtre déshydrateur	Trockner	Filtro deshidrator
4	Valvola espansione	Expansion valve	Détendeur	Expansionsventil	Valvola de espancion
5	Evaporatore	Evaporator	Evaporateur	Verdampfer	Evaporador
P	Pompa idraulica	Hydraulic pump	Pompe hydraulique	Hydraulikpumpe	Bomba hidraulica
M	Motore idraulico	Hydraulic motor	Moteur hydraulique	Hydraulikmotor	Motor hidraulico
C	Compressore	Compressor	Compresseur	Kompressor	Compresor



03



04

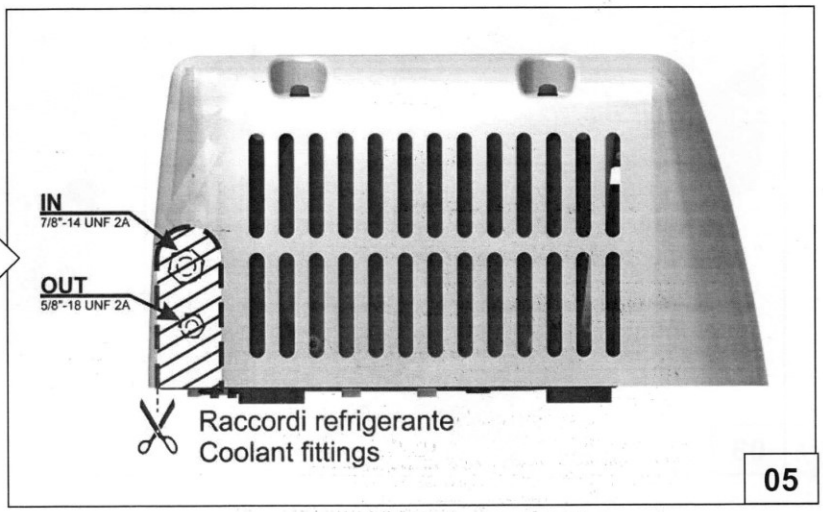
N.B.: se si utilizzano raccordi a blocchetto a 90° **non** è necessario eseguire questa apertura.

Please Note: if 90° block fittings are used, this opening **is not** necessary.

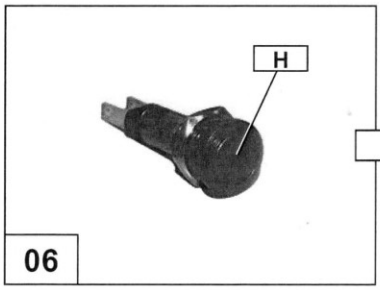
Remarque: si on utilise des raccords à blochet à 90° il **n'est pas** nécessaire d'exécuter cette ouverture.

Anmerkung: bei der Verwendung von 90°-Blockanschlüssen muss diese Bohrung **nicht** erfolgen.

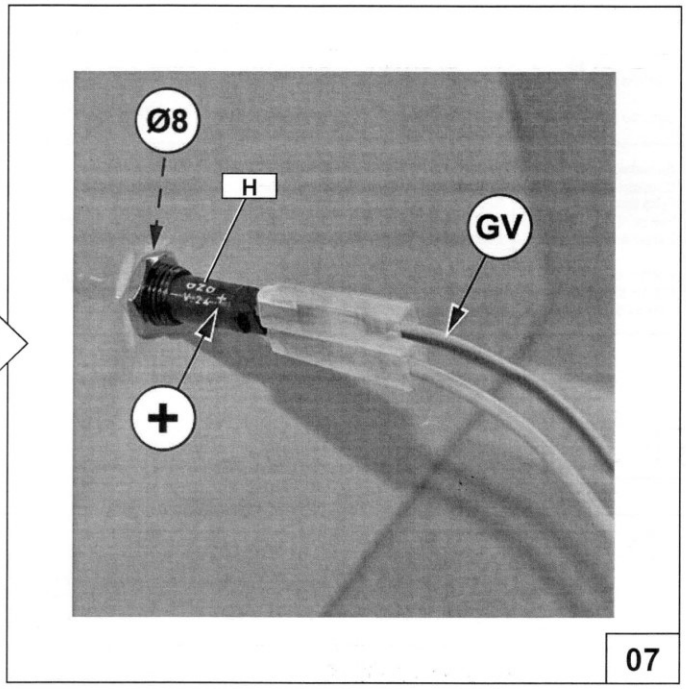
NOTA: si se usan racores en bloque de 90° **no es** necesario realizar esta abertura.



05

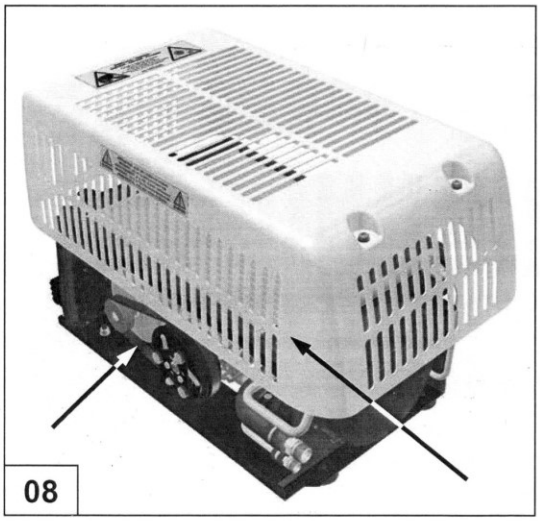


06

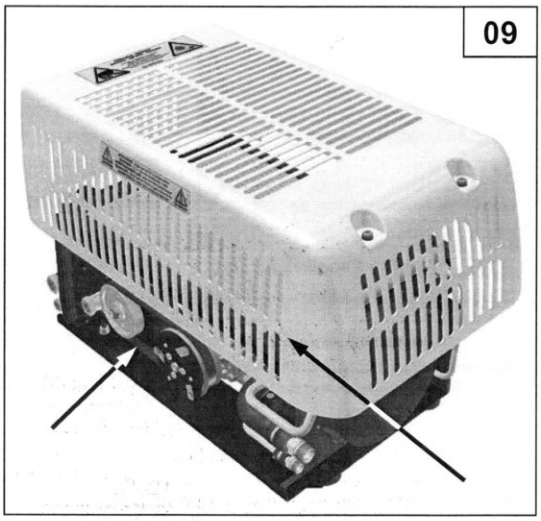


07

ATTENZIONE: montare la copertura con la parete grigliata sul lato della cinghia compressore.
CAUTION: secure the cover with the grilled wall on the side featuring the compressor belt.
ATTENTION: monter la couverture avec la paroi grillagée sur le côté de la courroie compresseur.
ACHTUNG: die Abdeckung mit zur Riemenseite des Kompressors gerichtetem Gitter einbauen.
ATENCIÓN: montar la cubierta con la pared dè rejilla hacia el lado de la correa compresor.



08



09

SCHEMA IMPIANTO ELETTRICO -Alimentazione elettrica (12 VDC) / (24 VDC)-
ELECTRICAL WIRING DIAGRAM -Electrical power supply (12 VDC) / (24 VDC)-
SCHEMA DE L'INSTALLATION ELECTRIQUE -Alimentation électrique (12 VDC) / (24 VDC)-
SCHEMA DER ELEKTRISCHEN ANSCHLÜSSE -Elektrische Stromversorgung (12 VDC) / (24 VDC)-
ESQUEMA ELÉCTRICO -Alimentación eléctrica (12 VDC) / (24 VDC)-

I

C	ARANCIO
A	AZZURRO
B	BIANCO
L	BLU
G	GIALLO
H	GRIGIO
M	MARRONE
N	NERO
S	ROSA
R	ROSSO
V	VERDE
Z	VIOLA

GB

C	ORANGE
A	LIGHT BLUE
B	WHITE
L	BLUE
G	YELLOW
H	GREY
M	BROWN
N	BLACK
S	PINK
R	RED
V	GREEN
Z	VIOLET

F

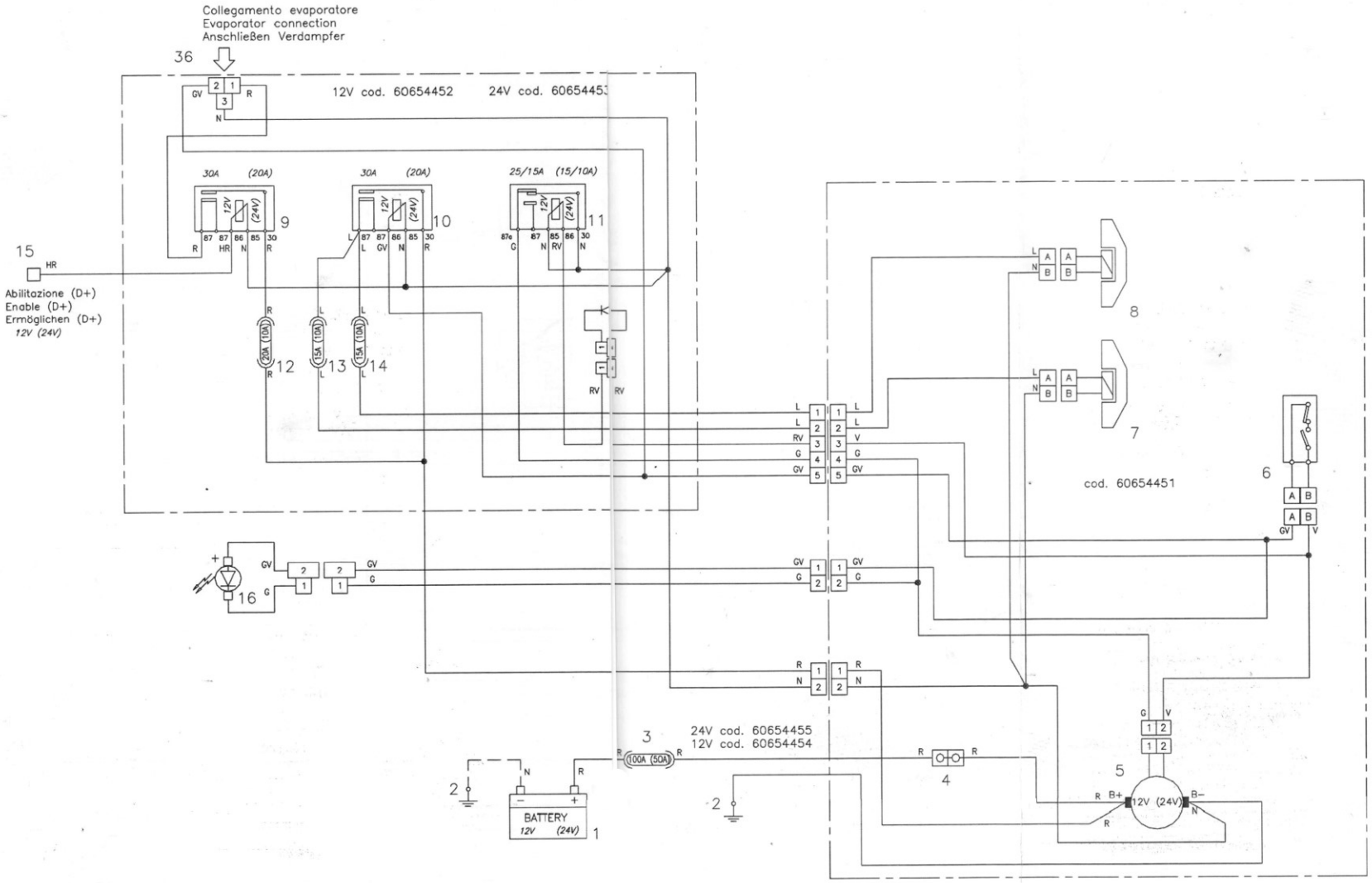
C	ORANGE
A	BLEU CIEL
B	BLANC
L	BLEU
G	JAUNE
H	GRIS
M	MARRON
N	NOIR
S	ROSE
R	ROUGE
V	VERT
Z	VIOLET

D

C	ORANGE
A	HELLBLAU
B	WEISS
L	BLAU
G	GELB
H	GRAU
M	BRAUN
N	SCHWARZ
S	HELLROT
R	ROT
V	GRÜN
Z	VIOLETT

E

C	NARANJA
A	AZUL
B	BLANCO
L	TURQUI
G	AMARILLO
H	GRIS
M	MARRON
N	NEGRO
S	ROSA
R	ROJO
V	VERDE
Z	VIOLETA



AUTOCLIMA
QUALITY & COMFORT

MODULA

SCHEMA IMPIANTO ELETTRICO -Alimentazione elettrica (80 VDC - 24 VDC)-
ELECTRICAL WIRING DIAGRAM -Electrical power supply (80 VDC - 24 VDC)-
SCHEMA DE L'INSTALLATION ELECTRIQUE -Alimentation électrique (80 VDC - 24 VDC)-
SCHEMA DER ELEKTRISCHEN ANSCHLÜSSE -Elektrische Stromversorgung (80 VDC - 24 VDC)-
ESQUEMA ELÉCTRICO -Alimentación eléctrica (80 VDC - 24 VDC)-

I

C	ARANCIO
A	AZZURRO
B	BIANCO
L	BLU
G	GIALLO
H	GRIGIO
M	MARRONE
N	NERO
S	ROSA
R	ROSSO
V	VERDE
Z	VIOLA

GB

C	ORANGE
A	LIGHT BLUE
B	WHITE
L	BLUE
G	YELLOW
H	GREY
M	BROWN
N	BLACK
S	PINK
R	RED
V	GREEN
Z	VIOLET

F

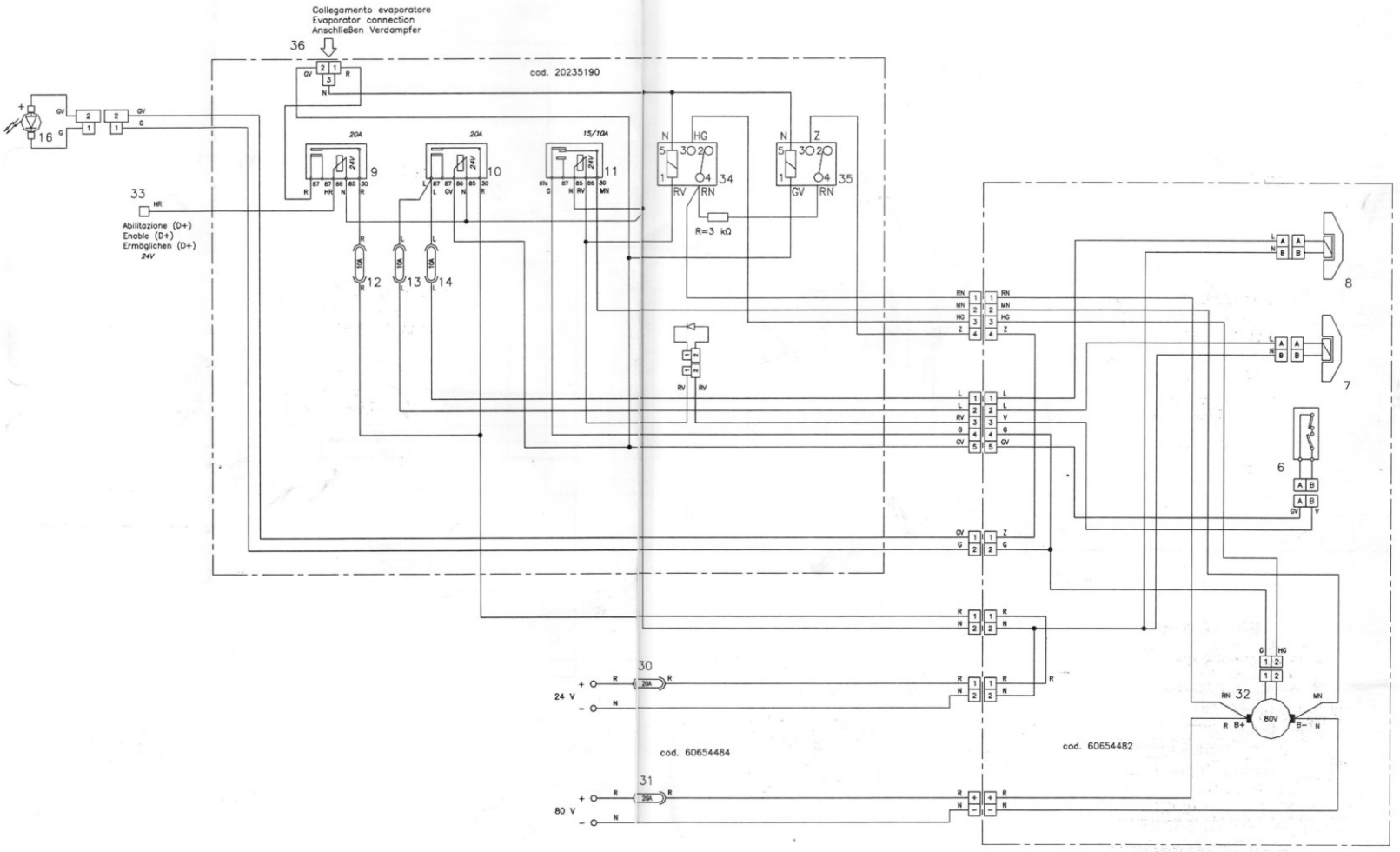
C	ORANGE
A	BLEU CIEL
B	BLANC
L	BLEU
G	JAUNE
H	GRIS
M	MARRON
N	NOIR
S	ROSE
R	ROUGE
V	VERT
Z	VIOLET

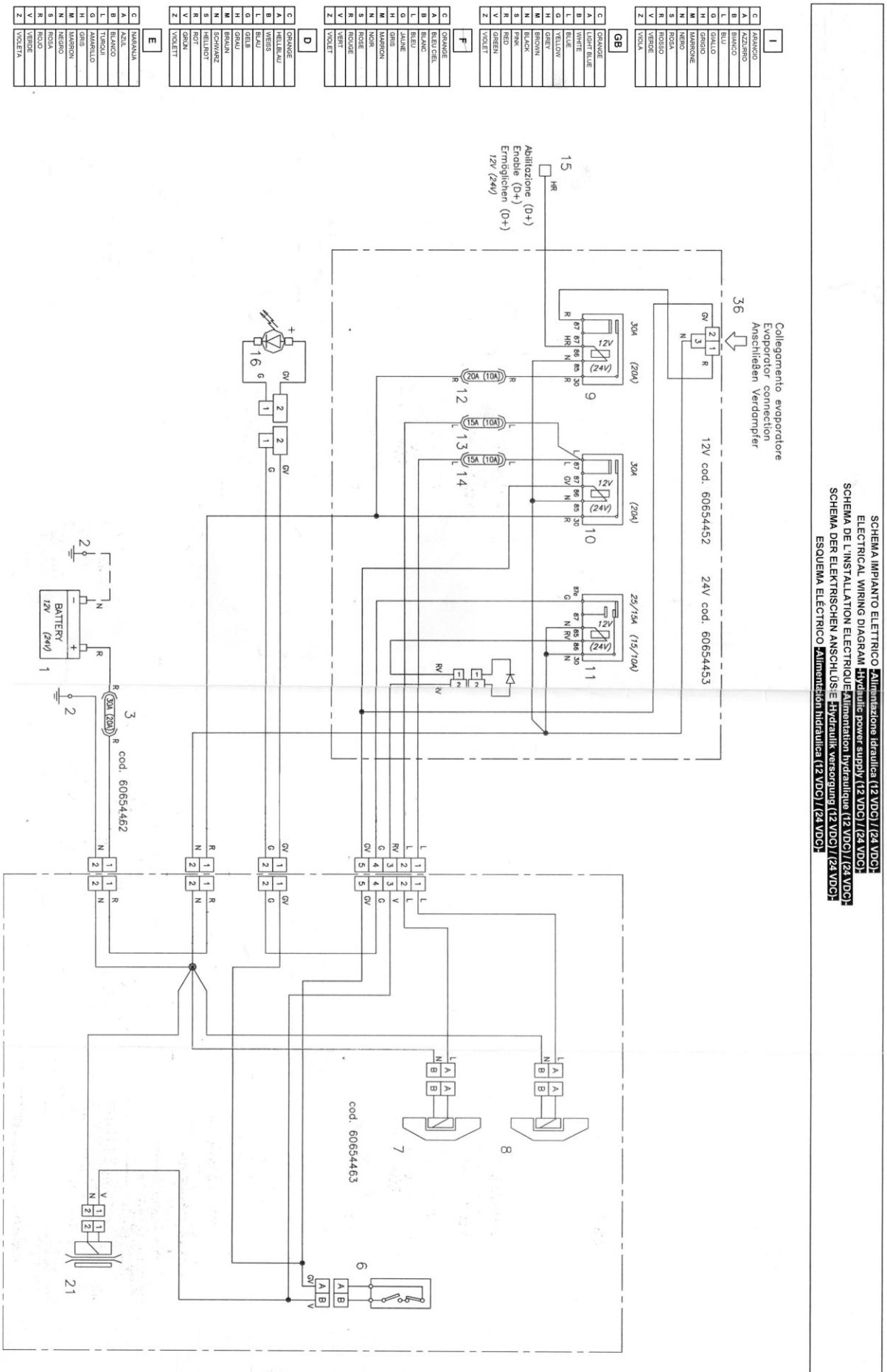
D

C	ORANGE
A	HELLBLAU
B	WEISS
L	BLAU
G	GELB
H	GRAU
M	BRAUN
N	SCHWARZ
S	HELLROT
R	ROT
V	GRUN
Z	VIOLETT

E

C	NARANJA
A	AZUL
B	BLANCO
L	TURQUI
G	AMARILLO
H	GRIS
M	MARRON
N	NEGRO
S	ROSA
R	ROJO
V	VERDE
Z	VIOLETA




AUTOCLIMA
QUALITY & COMFORT
MODULA
SCHEMA IMPIANTO ELETTRICO Alimentazione idraulica (12 VDC) / (24 VDC)
ELECTRICAL WIRING DIAGRAM Hydraulic power supply (12 VDC) / (24 VDC)
SCHEMA DE L'INSTALLATION ELECTRIQUE Alimentation hydraulique (12 VDC) / (24 VDC)
SCHEMA DER ELEKTRISCHEN ANSCHLÜSSE Hydraulik versorgung (12 VDC) / (24 VDC)
ESQUEMA ELÉCTRICO Alimentación hidráulica (12 VDC) / (24 VDC)
I
GB
F
D
E
Collegamento evaporatore
Evaporator connection
Anschließen Verdampfer
Abilitazione (D+)
Enable (D+)
Ermöglichen (D+)
12V (24V)
12V cod. 60654452
24V cod. 60654453
cod. 60654462
cod. 60654463
BATTERY
12V (24V)

AUTOCLIMA QUALITY & COMFORT

MODULA

LEGENDA SCHEMA IMPIANTO ELETTRICO
ELECTRICAL WIRING DIAGRAM KEY
LEGENDE SCHEMA DE L'INSTALLATION ELECTRIQUE
SCHEMA DER ELEKTRISCHEN ANSCHLÜSSE LEGENDE
LEYENDA ESQUEMA ALAMBRICO

RIF. REF. RÉF. BEZ. REF.	DESCRIZIONE DESCRIPTION NOMENCLATURE BEZEICHNUNG DENOMINACION
1	Batteria (+ 12 / 24 V) Battery (+ 12 / 24 V) Batterie (+ 12 / 24 V) Batterie (+ 12 / 24 V) Bateria (+ 12 / 24 V)
2	Collegamento a massa Hearting connection Connexion à masse Erdungsanschluss Conexion de masa
3	Fusibile Fuse Fusible Sicherung Fusible (100 A / 50 A) **(per versioni elettriche 12 VDC / 24 VDC) / (for electric models 12 VDC / 24 VDC) / (pour les modèles électriques 12 VDC / 24 VDC) / (für elektrische Modelle 12 VDC / 24 VDC) / (para los modelos eléctricos 12 VDC / 24 VDC)** (30 A / 20 A) **(per versioni idrauliche 12 VDC / 24 VDC) / (for hydraulic models 12 VDC / 24 VDC) / (pour les modèles hydrauliques 12 VDC / 24 VDC) / (für hydraulischen Modelle 12 VDC / 24 VDC) / (para los modelos hidráulicos 12 VDC / 24 VDC)**
4	Nodo di derivazione **(per versioni elettriche 12 VDC / 24 VDC)** Branch knot **(for electric models 12 VDC / 24 VDC)** Noeud de dérivation **(pour les modèles électriques 12 VDC / 24 VDC)** Knot Ableitung **(für elektrische Modelle 12 VDC / 24 VDC)** Nudo de derivación **(para los modelos eléctricos 12 VDC / 24 VDC)**
5	Motore elettrico **(per versioni elettriche 12 VDC / 24 VDC)** Electric motor **(for electric models 12 VDC / 24 VDC)** Moteur électrique **(pour les modèles électriques 12 VDC / 24 VDC)** Elektromotor **(für elektrische Modelle 12 VDC / 24 VDC)** Motor eléctrico **(para los modelos eléctricos 12 VDC / 24 VDC)**
6	Pressostato 2 livelli 2-level manostat Pressostat 2 niveaux Druckwächter 2 Niveaus Presóstato 2 niveles
7-8	Elettroventola condensatore Condenser electric fan Ventilateur électrique condenseur Elektrokondensatorventilator Electroventilador condensador

RIF. REF. RÉF. BEZ. REF.	DESCRIZIONE DESCRIPTION NOMENCLATURE BEZEICHNUNG DENOMINACION
9-10	Relè (30 A / 20 A) Relay (30 A / 20 A) Relais (30 A / 20 A) Relais (30 A / 20 A) Relè (30 A / 20 A)
11	Relè (25 A / 15 A) - (15 A / 10 A) Relay (25 A / 15 A) - (15 A / 10 A) Relais (25 A / 15 A) - (15 A / 10 A) Relais (25 A / 15 A) - (15 A / 10 A) Relè (25 A / 15 A) - (15 A / 10 A)
12	Fusibile (20 A / 10 A) Fuse (20 A / 10 A) Fusible (20 A / 10 A) Sicherung (20 A / 10 A) Fusible (20 A / 10 A)
13-14	Fusibile (15 A / 10 A) Fuse (15 A / 10 A) Fusible (15 A / 10 A) Sicherung (15 A / 10 A) Fusible (15 A / 10 A)
15	Abilitazione (D+) Enabling (D+) Activation (D+) Aktivieren (D+) Activación (D+) **(per versioni elettriche e idrauliche 12 VDC / 24 VDC) / (for electric and hydraulic models 12 VDC / 24 VDC) / (pour les modèles électriques et hydrauliques 12 VDC / 24 VDC) / (für elektrische und hydraulischen Modelle 12 VDC / 24 VDC) / (para los modelos eléctricos y hidráulicos 12 VDC / 24 VDC)**
16	Led **(vedi fig. 06 - 07)** Led **(see fig. 06 - 07)** Led **(voir fig. 06 - 07)** Led **(siehe Abb. 06 - 07)** Led **(vea fig. 06 - 07)**
21	Frizione elettromagnetica compressore **(per versioni idrauliche 12 VDC / 24 VDC)** Compressor electromagnetic clutch **(for hydraulic models 12 VDC / 24 VDC)** Embrayage électromagnétique compresseur **(pour les modèles hydrauliques 12 VDC / 24 VDC)** Kompressor elektromagnetische Kupplung **(für hydraulischen Modelle 12 VDC / 24 VDC)** Embrague electromagnético compresor **(para los modelos hidráulicos 12 VDC / 24 VDC)**

RIF. REF. RÉF. BEZ. REF.	DESCRIZIONE DESCRIPTION NOMENCLATURE BEZEICHNUNG DENOMINACION	
30	Fusibile (20 A) sulla linea 24 V **(per versioni elettriche 80 VDC - 24 VDC)** Fuse (20 A) on 24 V line **(for electric models 80 VDC - 24 VDC)** Fusible (20 A) sur la ligne 24 V **(pour les modèles électriques 80 VDC - 24 VDC)** Sicherung (20 A) in Zeile 24 V **(für elektrische Modelle 80 VDC - 24 VDC)** Fusible (20 A) en la línea 24 V **(para los modelos eléctricos 80 VDC - 24 VDC)**	
31	Fusibile (20 A) sulla linea 80 V **(per versioni elettriche 80 VDC - 24 VDC)** Fuse (20 A) on 80 V line **(for electric models 80 VDC - 24 VDC)** Fusible (20 A) sur la ligne 80 V **(pour les modèles électriques 80 VDC - 24 VDC)** Sicherung (20 A) in Zeile 80 V **(für elektrische Modelle 80 VDC - 24 VDC)** Fusible (20 A) en la línea 80 V **(para los modelos eléctricos 80 VDC - 24 VDC)**	
32	Motore elettrico 80 V **(per versioni elettriche 80 VDC - 24 VDC)** Electric motor 80 V **(for electric models 80 VDC - 24 VDC)** Moteur électrique 80 V **(pour les modèles électriques 80 VDC - 24 VDC)** Elektromotor 80 V **(für elektrische Modelle 80 VDC - 24 VDC)** Motor eléctrico 80 V **(para los modelos eléctricos 80 VDC - 24 VDC)**	
33	Abilitazione (24 V) Enabling (24 V) Activation (24 V) Aktivieren (24 V) Activación (24 V)	**(per versioni elettriche 80 VDC - 24 VDC) / (for electric models 80 VDC - 24 VDC) / (pour les modèles électriques 80 VDC - 24 VDC) / (für elektrische Modelle 80 VDC - 24 VDC) / (para los modelos eléctricos 80 VDC - 24 VDC)**
34-35	Relè (10 A) Relay (10 A) Relais (10 A) Relais (10 A) Relè (10 A)	**(per versioni elettriche 80 VDC - 24 VDC) / (for electric models 80 VDC - 24 VDC) / (pour les modèles électriques 80 VDC - 24 VDC) / (für elektrische Modelle 80 VDC - 24 VDC) / (para los modelos eléctricos 80 VDC - 24 VDC)**
36	Collegamento all'evaporatore Evaporator connection Connexion à évaporateur Verdampferanschluss Conexiòn con evaporador	

RIF. REF. RÉF. BEZ. REF.	DESCRIZIONE DESCRIPTION NOMENCLATURE BEZEICHNUNG DENOMINACION

NOTES AND GENERAL WARNINGS

⚠ **Read this manual carefully from start to finish before installation.**
For installation, it is important to strictly observe the instructions given in this manual.
The manufacturer declines all responsibility in the event of damages to people and things caused by incorrect installation or alterations of the system.

⚠ **Installation** operations must be carried out exclusively by a specialised technician who is aware of the dangers connected with installation and the relative prescriptions, in compliance with the standards in force and according to the instructions supplied by the manufacturer.
Use the protective devices and the equipment provided.

⚠ **WARRANTY**
Read the warranty certificate contained in the box of the system to correctly activate the product warranty.
Failure to perform the operations indicated will nullify the system warranty.

Use the system exclusively for the use envisaged by the manufacturer and make no arbitrary changes or alterations to the appliance.
AUTOCLIMA **does not** cover modified or transformed systems with a warranty.

⚠ The system is not designed for use in potentially explosive environments.

⚠ The system is not designed for use in a saline environment.

The instructions refer to the **RIGHT** and the **LEFT** and are related to the driver of the vehicle facing the direction of travel.

The moto-condenser weighs about 30 kg. When handling, installing, repairing or using, please take whatever precautions are necessary in order to avoid falls, damage and injuries. DO NOT handle alone.

Check that the vehicle structure is strong enough in the assembly area to sustain the weight and stress generated by the system.
THE FITTER MUST REINFORCE THE VEHICLE STRUCTURE IF NECESSARY.

During the assembly phases, making holes in parts of the vehicle, make sure that you do not damage the wiring or piping of systems already installed.

USE APPROPRIATE PRODUCTS TO ADEQUATELY SEAL EVERY HOLE MADE IN THE VEHICLE WALLS.

You must accurately position the hoses and avoid tight curves, sharp corners or sheet metals that could damage them.
Make sure that throughout the route the hoses avoid siphons.

⚠ **BEFORE INSTALLATION AND MAINTENANCE OF THE AIR CONDITIONER, DISCONNECT ALL CONNECTIONS TO THE VEHICLE BATTERY AND TO EVERY OTHER SOURCE OF ENERGY. FAILURE TO OBSERVE THIS INSTRUCTION WILL EXPOSE THE FITTER TO A RISK OF ELECTROCUTION AND PHYSICAL DAMAGE DUE TO THE MOVEMENT OF MECHANICAL PARTS (PULLEYS, BELTS, ELECTRIC FANS).**

⚠ If the electrical wires have to pass through walls with sharp edges, use protective pipes or specific channels.

⚠ Securely fasten the electrical wires, paying special attention to their route along metal walls that conduct electricity; also avoid contact with sharp elements.

CHECK THE POSSIBLE NEED TO REPLACE THE VEHICLE'S ALTERNATOR WITH A MORE POWERFUL ONE TO COMPENSATE FOR THE ELECTRIC ABSORPTION OF THE SYSTEM.

Connect the air conditioner to the vehicle power supply protecting the system with a fuse.

	Maximum coolant load is **500 g of R134a**, considering a **maximum length of the relative piping** of **5 m** per pipe. To perform loading operations, follow indications regarding method, type and quantity of coolant. **THE USE OF COOLANT OTHER THAN THE ONE INDICATED IS NOT ALLOWED.** Contact AUTOCLIMA technical assistance in case of doubts.

	Close or open the connections of the cooling circuit, using two spanners to balance the tightening torque.

⚠	**When working near to the coils (evaporator and/or condenser) pay attention not to cut yourself on the edges of the fins.**

⚠	During operations that implicate the **handling of cooling fluid**, remember that: - when it is close to a source of heat it produces an unpleasant smelling gas which irritates the eyes and the respiratory system - a circuit containing cooling fluid must never be heated with a flame, because it is easily inflammable - in its liquid state, cooling fluid evaporates when it comes into contact with the atmosphere and freezes everything it comes into contact with. If it freezes: - **plunge the frozen part immediately into COLD water**. If there is no water available, gently wrap the frozen part in a clean cloth. If the cooling fluid has come into contact with the eyes, rinse them thoroughly with clean water and see a doctor.

	Avoid contact with synthetic oils. Wash carefully after contact.

⚠	The oil contained in the system is inflammable. **BEFORE OPERATING ON THE COOLING CIRCUIT WITH FLAMES, ENSURE THAT THERE ARE NO TRACES OF COOLANT LEFT INSIDE THE SYSTEM.** Perform the recovery and open the system; wait for the remaining coolant to come out. **ATTENTION: SOME PARTS OF THE SYSTEM MAY CONTAIN OIL THAT CAN IGNITE EVEN IN THE ABSENCE OF COOLANT.**

	Dispose of the packing materials as required by the standards in force, separating them if a separate waste disposal system is available.

WARNINGS AND ASSEMBLY INSTRUCTIONS

⚠ The matching evaporator requires the following power:
for **Modula MK** at **12 VDC** → evaporator at **12 VDC**
for **Modula MK** at **24 VDC** → evaporator at **24 VDC**
for **Modula MK** at **80 VDC - 24 VDC** → evaporator at **24 VDC**

⚠ Before commencing installation, check that the area of the vehicle where the moto-condenser will be assembled, normally the roof, is flat and horizontal.
As an example, the instructions illustrate an installation on the roof of the vehicle.

⚠ Check that the roof surface intended for installing the motor-condenser is strong enough; if necessary reinforce the structure with supporting crossbeams and struts.
This intervention will avoid the formation of concave areas in the area where the motor-condenser is installed, which could cause water to accumulate and to infiltrate the vehicle.

⚠ For the electric version of **"MODULA"** it is necessary for the vehicle on which the cooling unit is installed to be equipped with an alternator which can meet the required electrical absorption. Otherwise, we suggest replacing it with one which can better meet the required demands.

1 Before lifting the motor-condenser on top of the vehicle's roof, remove the outer cover unscrewing the relative securing screws.

2 In order to secure the motor-condenser, you will need 4 **holes** for the securing points + **any additional holes** for the wiring + **any further additional** holes for the passage of oil pipes for feeding the hydraulic motor (for the hydraulic **"MODULA"** version) **(fig. 01)**.

⚠ **Before cutting any part of the vehicle's bodywork, disconnect its battery; check that the section of roof you intend to cut does not house any electrical wiring.**
Cut the openings between the roof's supporting struts, without removing them.

3 Coat the edge of the holes for securing the unit with a suitable sealing agent **(fig. 02)**.

4 4 rubber spacers **C** (Ø44) are supplied for the installation, which must be inserted between the motor-condenser's base and the vehicle's roof **(fig. 02)**.

When positioning the rubber spacers above the 4 Ø8mm holes previously cut, we suggest coating the contact surfaces of the roof and their outside edge with a suitable sealing agent.

5 Position the motor-condenser and secure it to the roof using **M8 screws (not supplied) (fig. 02)**.

6 For the hydraulic **"MODULA"** version, it is necessary to connect the oil pipes feeding the hydraulic motor (coming from the vehicle's hydraulic circuit system) to the corresponding **inlet (1/2" GAS)**, **outlet (1/2" GAS)** and **drain (1/4" GAS) (page 8 and fig. 03-04)** fittings. Pipe installation is the responsibility of the fitter.

For the hydraulic **"MODULA"** version, it is necessary to cut openings in the motor-condenser's outer shell corresponding to the oil pipe fittings in order to avoid any interference **(fig. 04)**.

7	Connect the coolant pipes to the relative fittings: **input (7/8")** and **output (5/8")**. The moto-condenser has been designed to use coolant pipes with **90° block** fittings. In case other fittings are used, it may be necessary to perform an opening on the outer shell of the moto-condenser where the fittings are located in order to avoid interference. Example of opening on **fig. 5**.
8	Complete all electrical wire connections following the instructions of the **electrical wiring diagram**.
9	Together with the power wiring you will find a led **H** which signals, according to its flashes, a series of possible malfunctions; the table with the error codes is included in the section **OPERATION**. The led can be installed anywhere, preferably where it can be easily seen by the operator. **PAY ATTENTION** to the correct connection of the electrical contact **(fig. 06 - 07 and electrical wiring diagram)**. If the led is **installed remotely**, it is necessary to place between it and the power wiring, an extension cable harness **(not supplied)**.
10	For the electric **"MODULA"** version **(12 VDC) / (24 VDC):** connect the supplied **red** power wiring cable to the derivation node **("4" electrical wiring diagram; "A.15" page 8-9)**, connect the protection fuse **(100A - 12V / 50A - 24V)** and connect to a battery or to the alternator. **The fuse must be located near the battery or alternator (electrical wiring diagram)**. Ground the **black** wire to the chassis. For the electric **"MODULA"** version **(80 VDC - 24 VDC):** **a)** connect the supplied 2-way connector of the electrical wiring **24 V** to its counterpart **("A.17" page 9)** on the motor-condenser and connect the protection fuse 20 A **("30" electrical wiring diagram)**. **The fuse must be located near the battery (electrical wiring diagram)**. **b)** connect the supplied 2-way connector of the electrical wiring **80 V** to its counterpart **("A.16" page 9)** on the motor-condenser and connect the protection fuse 20 A **("31" electrical wiring diagram)**. **The fuse must be located near the battery (electrical wiring diagram)**. For the hydraulic **"MODULA"** version **(12 VDC) / (24 VDC):** connect the supplied 2-way connector of the electrical wiring to its counterpart on the cooling unit, connect the protection fuse **(30A - 12V / 20A - 24V)** and connect to a battery or to the alternator. **The fuse must be located near the battery or alternator (electrical wiring diagram)**. Ground the **black** wire to the chassis.
11	Secure the external shell with screws **AA-BB-CC-DD (fig. 02)** and check correct operation. **CAUTION: secure the cover with the grilled wall on the side featuring the compressor belt.**

OPERATION

The moto-condenser is designed to be combined with an evaporator with a **maximum** cooling capacity of **4 kW**.
The interface connector **"36" (electrical wiring diagram)**, prepared for connection with the evaporator is three-way: positive **(R)** and negative **(N)** for evaporator power supply and the positive signal **(GV)** for the compressor command. Maximum absorptions of the matching evaporator are: **20A** for the **12V** version, **10A** for the **24V** and **80V** versions (matching evaporator: **only 24V**).

While using the cooling unit, you may experience interruptions in its operation; these are recorded and signalled by means of the supplied led light.
For the electric **"MODULA"** version, consider all points indicated in the table **(1 ÷ 8)**.
For the hydraulic **"MODULA"** version, consider **only** points **6 - 7 - 8**.
Error codes are explained in the following table:

Point	Error code	Cause	Solution
1	1 flash	**Overheating of the electric motor. Temperature has exceeded 113°C.** The cooling unit can restart only if it is turned off then on again, but only if its temperature has fallen below 109°C.	Check that the motor is correctly cooled by the fan. Have a technician check that there is not an excessive amount of coolant (R134a) in the system.
2	2 flashes	**The battery is low.** Battery power has fallen below 9V (for the 12V unit), below 17V (for the 24V unit) or below 60V (for the 80V unit).	Check that the battery is correctly recharged and that the alternator is suitable. Check that the vehicle's engine is not running at low rpm for extended periods of time (more than 15 minutes).
3	3 flashes	**Excessive power consumption of the electrical motor.** > 70A (for the 12V unit) > 35A (for the 24V unit) > 25A (for the 80V unit)	Check the unit's electrical absorption. Have a technician check that there is not an excessive amount of coolant (R134a) in the system, that there are no blockages, grime on the condenser or condenser fans malfunction (check the fuses).
4	5 flashes	**Excessive voltage.** The battery power has exceeded 18V (for the 12V unit), 32V (for the 24V unit) or 100V (for the 80V unit).	Check that the alternator is supplying its nominal voltage and that this corresponds with the nominal voltage of the battery and of the cooling unit.
5	6 flashes	**Insufficient voltage.** The battery power has fallen below 10.5V (for the 12V unit), 21V (for the 24V unit) or 71V (for the 80V unit).	Check that the battery is correctly recharged and that the alternator is suitable. Check that the vehicle's engine is not running at low rpm for extended periods of time (more than 15 minutes).
6	Light is fixed	**Low pressure in the system.** The pressure switch (for low pressure) is calibrated so as to activate when pressure falls under 2 bar; this happens when there is a low amount of coolant (for example in case of a leak) or when the outside temperature is less than 5°C.	Have a specialized technician check that the unit's circuit is sealed and reload with R134a.
7	Light and electric motor (electric version) / compressor clutch (hydraulic version) are cyclically on and off	**High pressure in the system.** The pressure switch (for high pressure) is calibrated so as to activate at a pressure exceeding 14 bar; this happens when there is an excessive amount of coolant, a blockage in the cooling circuit or when the condenser is not correctly ventilated.	Have a technician check that there is not an excessive amount of coolant (R134a) in the system, that there are no blockages, grime on the condenser or condenser fans malfunction (check the fuses).
8	Light off but cooling unit is inoperative	**The cooling unit is not working but the led light is not signalling it.** This may be due to electrical/hydraulic problems.	Check if the led light is correctly working. Check fuses, relays, electrical wiring and connections. Check hydraulic circuit.

MAINTENANCE AND SUGGESTIONS FOR USE

⚠ **Any repairs or operations to top up and recuperate coolant must be carried out by authorised Autoclima workshops and by qualified personnel.**

⚠ **After 1.500 Km**, from the conditioner installation, carry out a general inspection, particularly check that the screws and bolts, are tightened.

Twice a year, check the tension for the compressor trailing belt; if it is worn out, replace it by one of the same type.

The correct operation of the conditioning unit depends on regular maintenance.

If the air-conditioner is used in very dusty environments, upkeep the system more frequently.

It is advisable to keep the vehicle doors and windows closed while the conditioning system is running.

⚠ Before removing the cover of the conditioner to carry out maintenance and cleaning operations, disconnect the vehicle battery.

When cleaning the system, protect the electric components.

If any electric components need replacing, you can access them easily by removing the outside cover of the air conditioner system.

Avoid leaving the conditioning unit inactive for long periods of time, activating it for at least **half an hour once a month**, even during the winter, as operation guarantees the lubrication of certain components which tend to dry out if left idle for too long.

Check the condenser coil **regularly** and, if necessary, clean it using compressed air, taking care not to damage the aluminium fins.

Insects, fluff and other foreign bodies may be deposited on the fins, leading to a reduction in the effectiveness of the heat exchanger.

⚠ When working near the heat exchangers, pay attention not to cut yourself with the sharp ends of the fins.

At the same time, inspect the working of the condenser electric fans.

Consider that the cleaning of the condenser and the inspection of the right ventilation are very important operations. As a matter of fact, a very dirty or non-ventilated condenser, reduces the conditioning system performances and shorter the compressor duration, up to the break of the compressor or of its electromagnetic joint.

Periodically check that water condensation discharge pipes located at the base of the cooling unit are not blocked.

The cooling system uses **R134a coolant**. **Maximum** coolant load is **500 g of R134a**, considering a **maximum length of the relative piping** of **5 m** per pipe.

At the beginning of every season, it is advisable to check that the system is full of coolant. A lack of coolant usually causes a drop in performance. The check can be carried out by connecting a filling station and checking the pressure levels. Should there be a severe lack of coolant, before topping up it is necessary to locate the leakage point and find a remedy. In this case it is also advisable to check the level of lubricant in the compressor and top it up if necessary.

At the beginning of every season, inspect every system component, including the electrical components, to ensure that there are no anomalies.

In the event of considerable rapairs, we recommend to replace the receiver drier.

This operation is essential if the system stays open a long time, or in case of inside moisture.