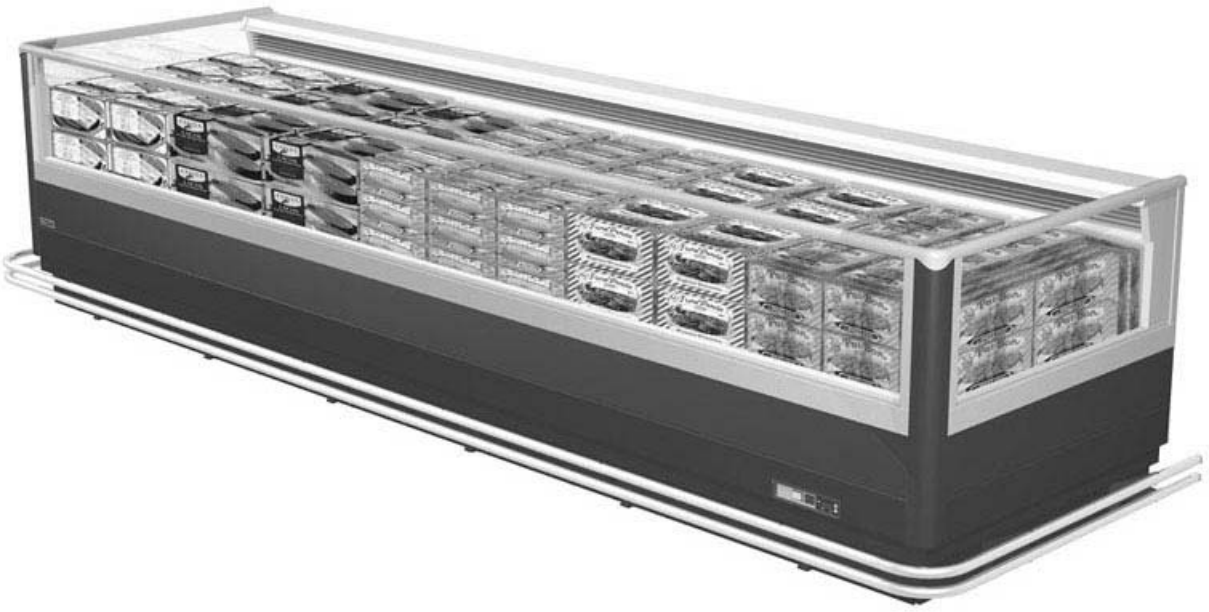
instructions for installation

Epta

LEOPARD



COSTAN® REFRIGERATION

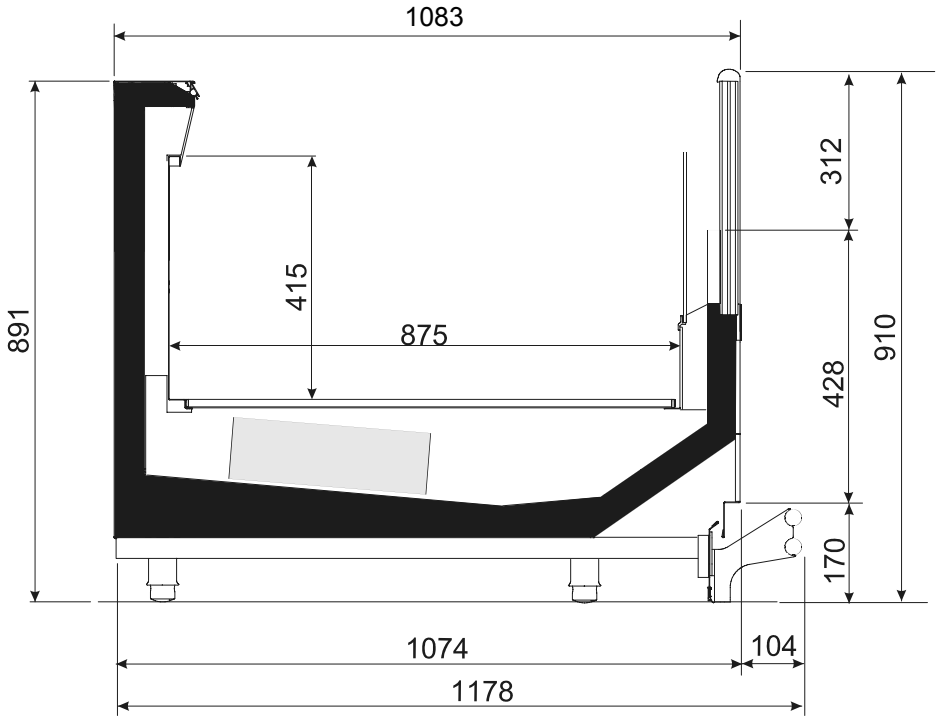
member of Epta-Group

N° DOC. QSM000259E - 10/05/07 - rev. C

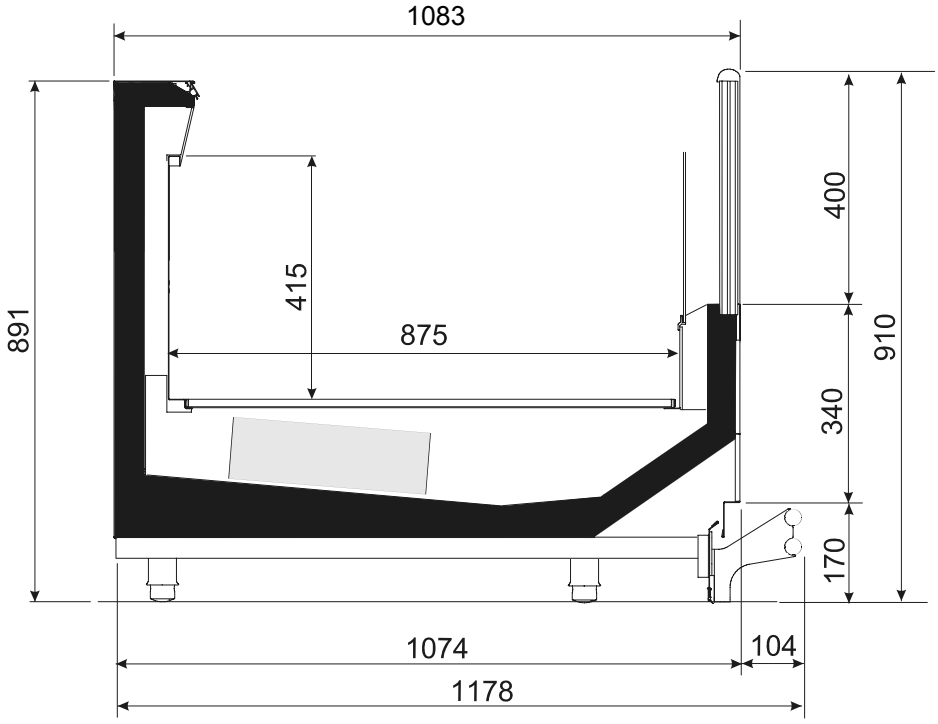
KEY

"-" First issue:
A, B, C..... revision index

LEOPARD LG300

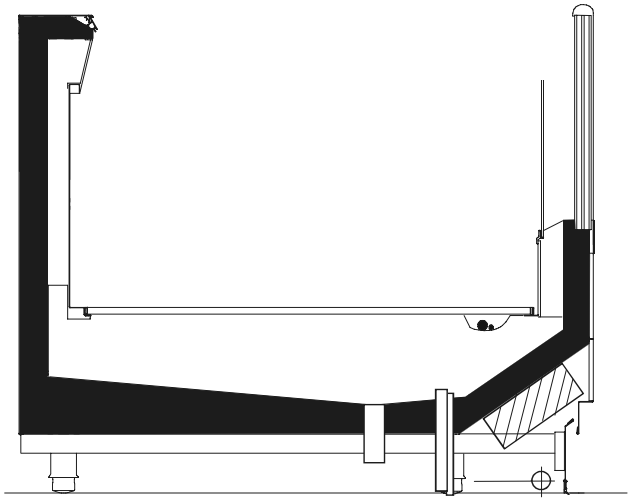


LEOPARD HG400



INSTALLATION DIAGRAMS

CONNECTIONS - CROSS SECTION



water drain outlet Ø40

route of refrigerating pipes

Refrigerating connection
inlet Ø 10 mm
outlet Ø 20 mm

electrical board

route of drain piping

CONNECTIONS - PLAN FOR LEOPARD LINEAR CABINET - without end panels

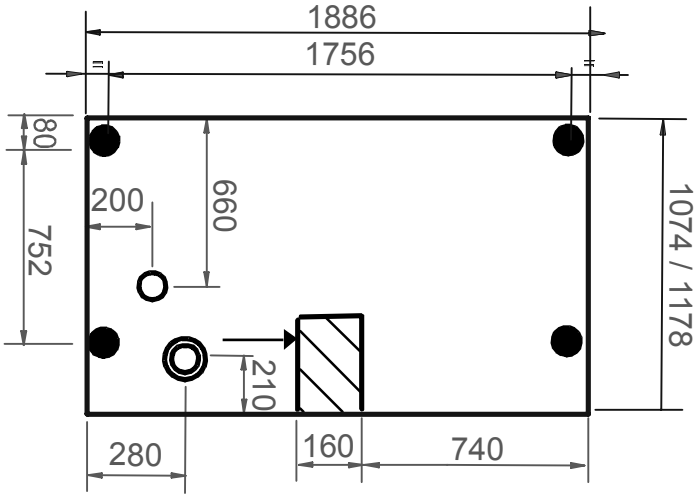
● feet

○ water drain outlet Ø40

◎ refrigerating connection

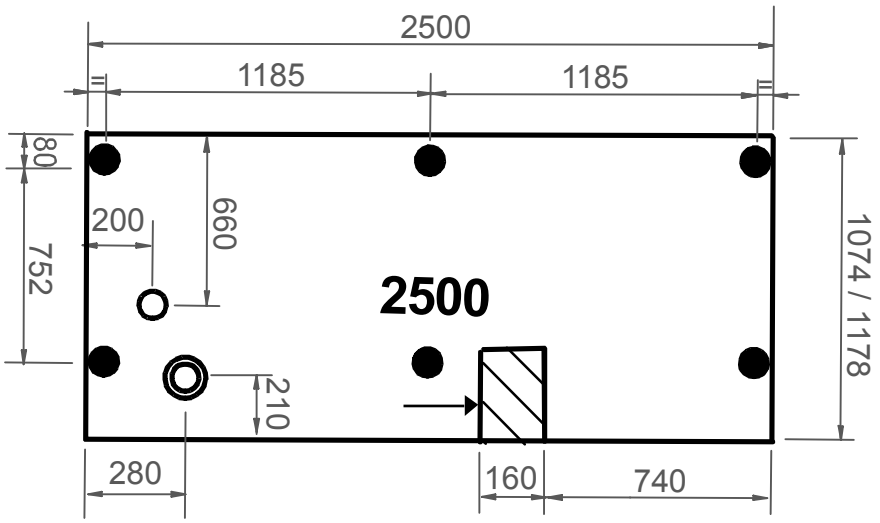
▨ electrical board

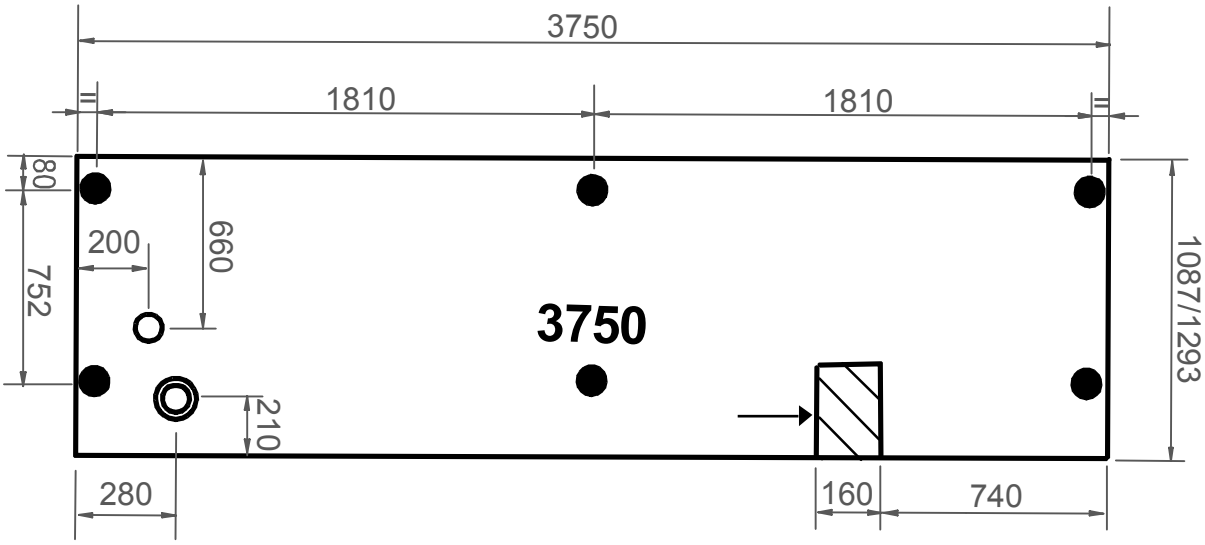
→ electrical board inlet



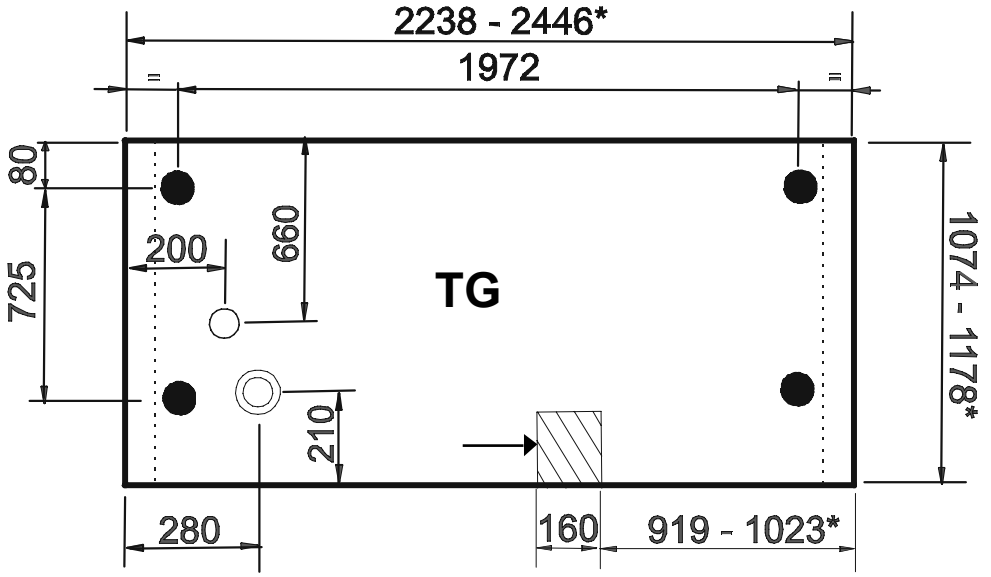
Thickness of blind end panel = 51mm
Thickness of glass end panels = 70 mm

CAUTION: do not fully unscrew the feet of the cabinet.
the height of the handrail from the heart has to be of 910mm.





CONNECTIONS - PLAN FOR LEOPARD HEAD CABINET



* ·optional bumper rail

● feet

○ water drain outlet Ø40

◎ refrigerating connection

▨ electrical board

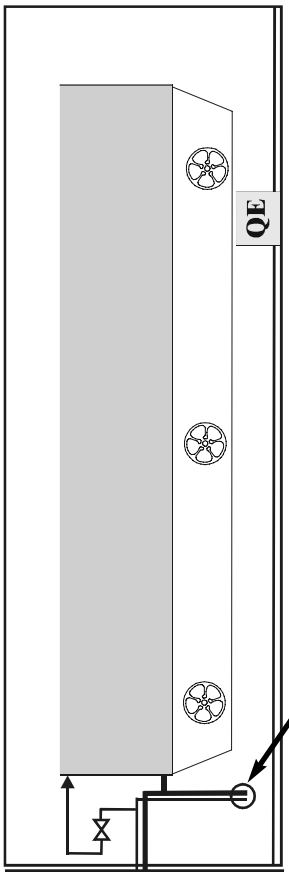
→ electrical board inlet

CAUTION: do not fully unscrew the feet of the cabinet.
the height of the handrail from the heart has to be of 910mm.

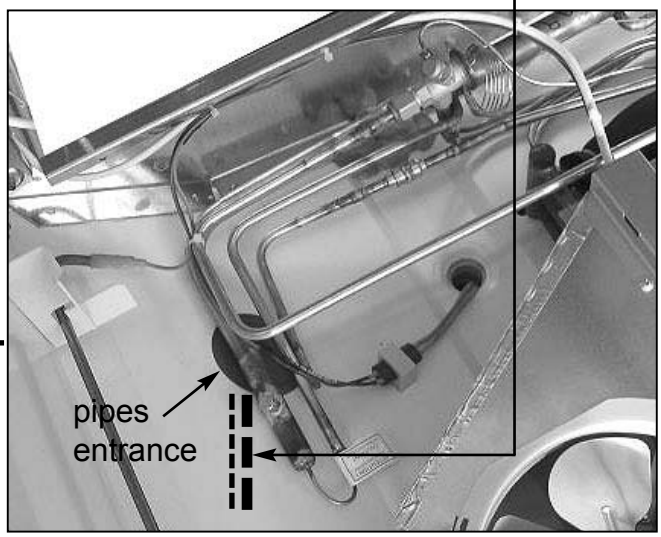
USE OF THE CABLE SUPPLIED WITH THE ACCESSORIES BOX

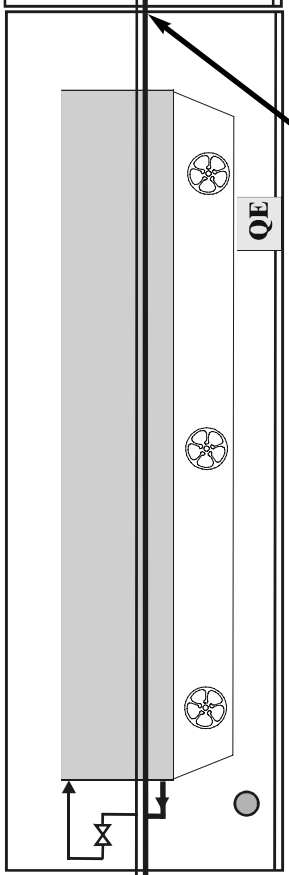
The cable shown in the photo below - supplied with the accessories box - needs to be used when the display cabinet is fitted with a EKC201 controller with synch.
In this case signal transmission between MASTER and SLAVE needs to be inverted. The cable in question must be connected in series to the long cable (for further details, see relevant wiring diagram).

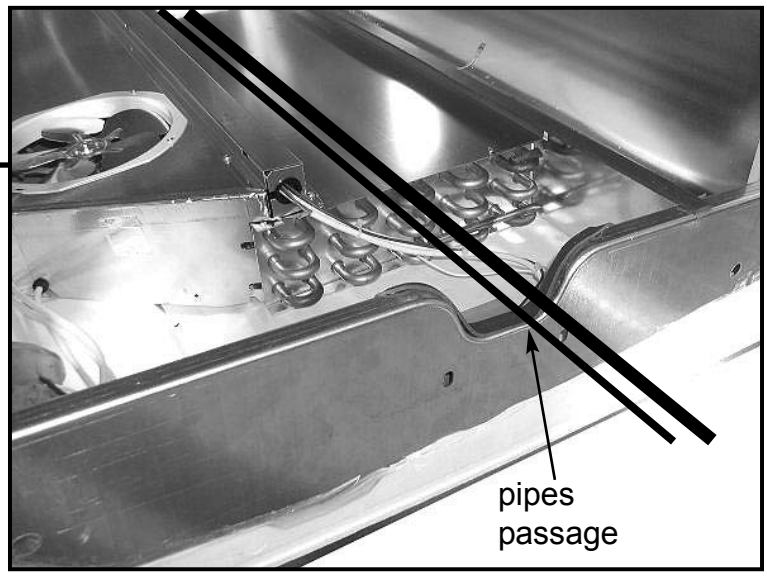
REFRIGERATING CONNECTION IN THE CHEST



Restore cold-tight.
Suction pipe should be insulated since the outlet of the cabinets.





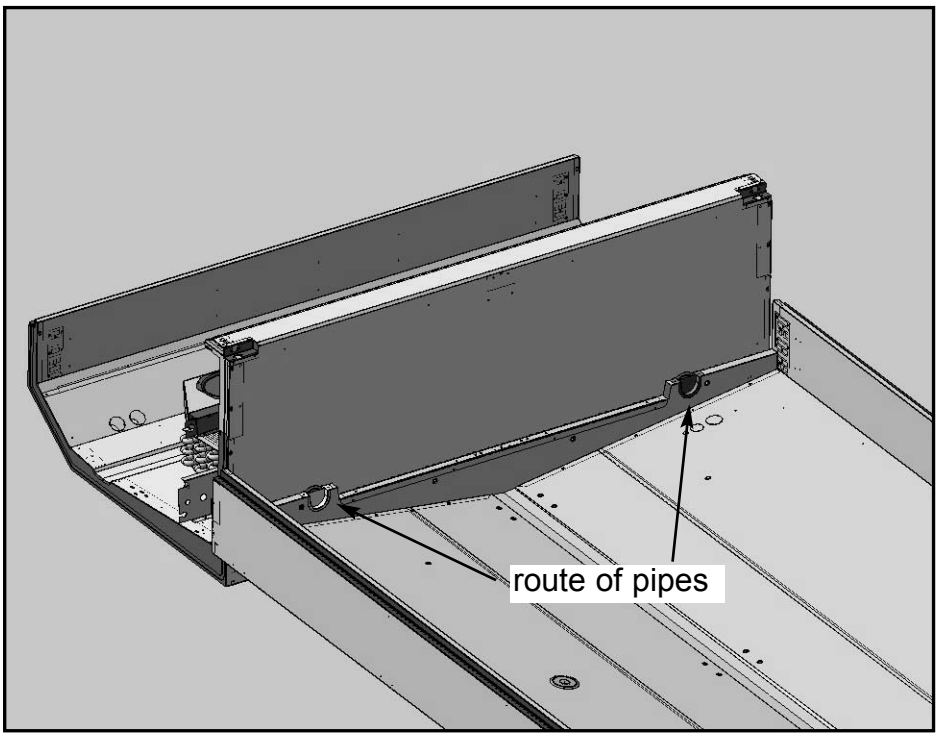


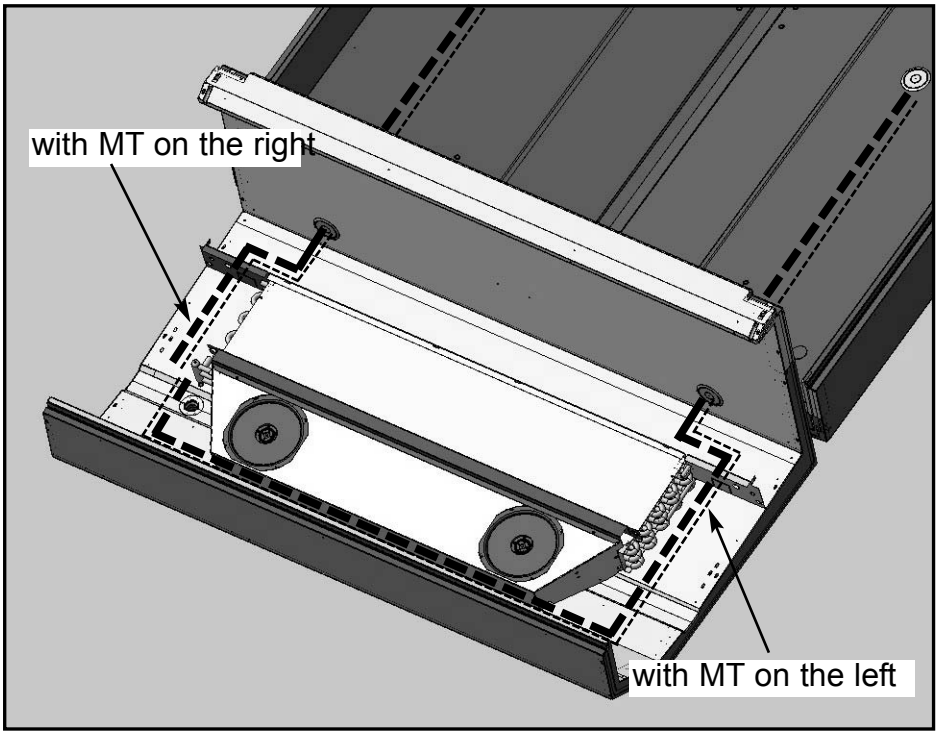
liquid line

suction line

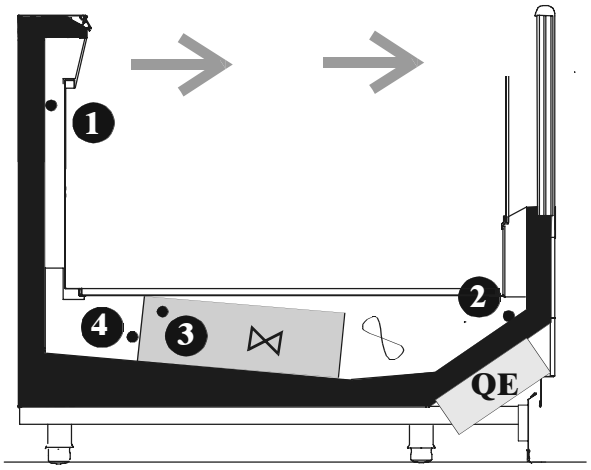
REFRIGERATING CONNECTION IN THE CHEST HEAD CASE

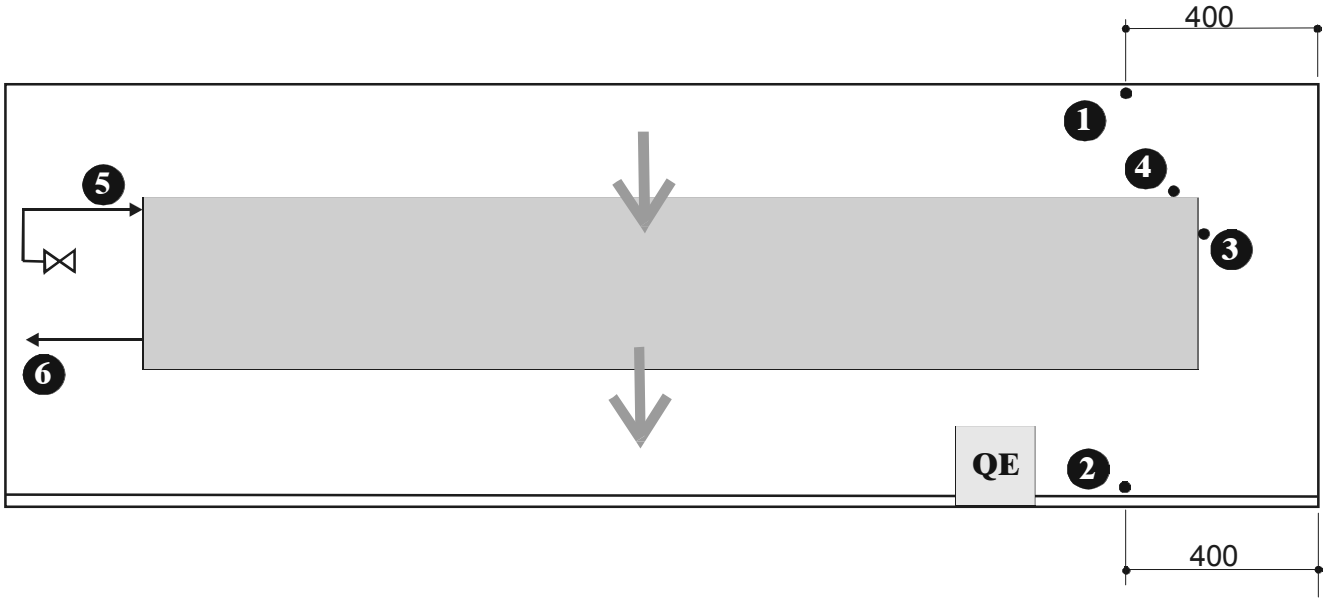
The route of pipes entering the cabinets is on the back of the cabinet, where the piping enters straight cabinets
As for the route of pipes between straight cabinets and MTs, follow the diagram below.





POSITION OF PROBES FOR LEOPARD





❶ air outlet probe sensor (AO)

❷ air inlet probe sensor (AR)

❸ defrost-end probe sensor (ED)

❹ safety thermostat

❺ evaporator in-going piping Ø10 mm - without thermostatic valve Ø12 mm

❻ evaporator out-going piping Ø20 m

REQUIRED HEAT EXTRACTION RATE - ADJUSTMENT

EN ISO 23953-2005
CLA 3 : 25°C - 60% HR

BT VERSION

M	T_o (°C)	Φ_O (W)					
		W/m		188	250	375	TG
LEOPARD BT	-35	430		810	1080	1610	960

S.L.C.								
M	Ctrl		Def					
	Ci ° C	Co ° C	Type	N/24 h	T°ter °C	t_d min	t_{egout} min	t_{ventil} min
LEOPARD BT	-28	-32	**Electrique** *Electric* Elettrico	**2**	**+5**	**30**	**0**	**0**

TN VERSION

M	T_o (°C)	Φ_O (W)					
		W/m		188	250	375	TG
LEOPARD TN	-9	270		510	675	1010	605

S.L.C.								
M	Ctrl		Def					
	Ci ° C	Co ° C	Type	N/24 h	T°ter °C	t_d min	t_{egout} min	t_{ventil} min
LEOPARD TN	-4	-8	**Electrique** *Electric* Elettrico	**2**	**+5**	**25**	**0**	**0**

t_d: defrost duration - t_{egout}: drip-off duration - t_{vent} : fan start delay

REFRIGERATION CAPACITY VARIATIONS WITH CLIMATE CLASS

CLA	Température bulbe sec *Dry bulb temperature* Temperatura bulbo secco °C	Humidité relative *Relative humidity* Umidità relativa %	Facteur de correction pour bilan thermique *Correction factor for heat extraction rate* Fattore di correzione per la potenza frigorifera Φ_O	Correction température d'évaporation *Evaporating temperature correction* Correzione della temperatura di evaporazione T_o	Dégivrage *Defrost* Sbrinamento N / 24h
2	22	65	(Φ_O CLA 3) **x 0,96**	**Reference**	2
3	25	60	**Reference**		2
4	30	55	(Φ_O CLA 3) **x 1,2**		3
6	27	70			

SETTINGS IN STORE CONDITIONS

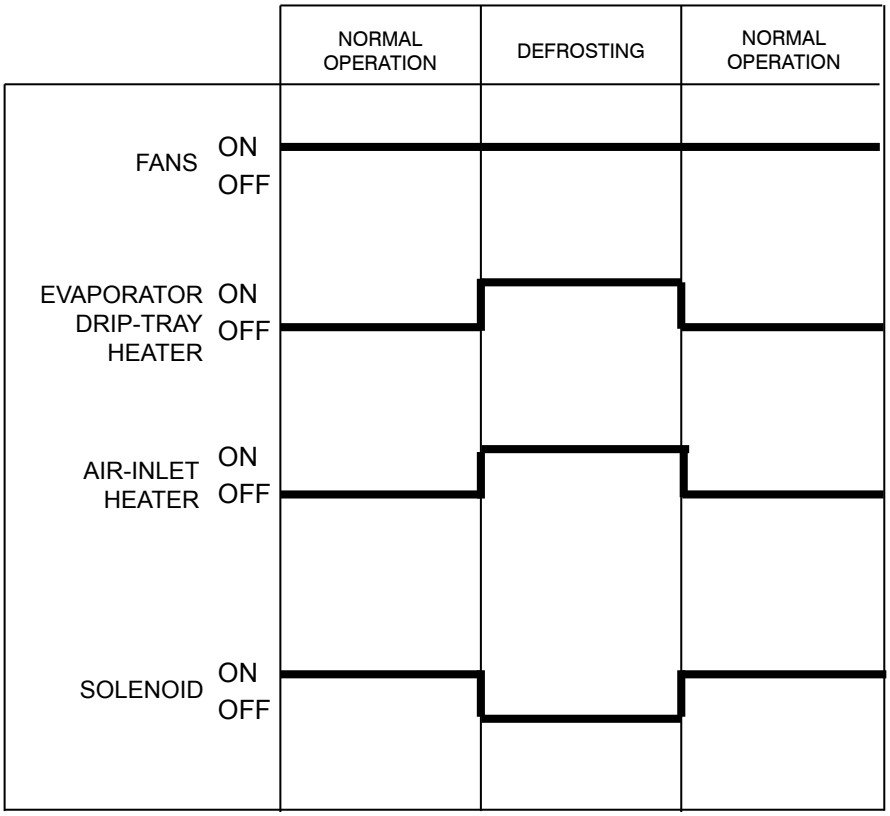
M	Temps de sécurité pour les dégivrages *Safety time for defrost* tempo massimo di sbrinamento min	Alarme hors période de dégivrage *Alarm out of defrost time* Allarmi fuori dal periodo di sbrinamento Seuil *Threshold* Soglia °C		Temporisation *Delay time* Ritardo min	Période d'occultation après fin de dégivrage *Minimum time after defrost termination* tempo di ritardo allarme dopo lo sbrinamento min	Température maxi de l'air à la reprise hors période de dégivrage *Maxi air temperature at the air return out of defrost time* Massima temperatura dell'aria fuori dal periodo di sbrinamento °C
BT	45	S in	-11	30	60	-18
		S out	-22			
TN		S in	+5			2
		S out	+2			

For display cabinets fitted with or without night curtain an operational optimisation can be carried out to obtain better electrical energy savings by using the two sensors with the following settings

M	S out		S in	
	Ci °C	Co °C	Ci °C	Co °C
BT	-28	-32	-18	-20
TN	-4	-8	2	0

Electrical energy savings on cold production amount to around 18% while the specify night curtain is installed.

PRICIPLE OF OPERATION



ELECTRICAL INPUT

Voltage: 380-400V / 3PH / 50 hz

α : Ventilateur standard */ Standard fan* / Ventilatori di serie

β : Ventilateur basse consommation d'énergie */ Energy saving fan* / Ventilatori a basso consumo

MODELES MODELS MODELLE	L		**Ventilateurs** *Fans* Ventilatori			**Cordons chauffants** *Heaters* Antiappannanti						**Dégivrage** *Defrost* Sbrinamento							
												Gaz chaud / *Hot gas* / Gas caldo			électrique / *Electric* / Elettrico				
			230 Vac mono 50 Hz											230V mono			230V mono	230V tri	400V tri+N
			Nr	W	A	W(1)	A	W(2)	A	W(3)	A	Nr	W	A	Nr	W	A	A	A
LEOPARD BT	**188**	α	2	80	0,50	79	0,3	27	0,1	39	0,17	1	530	2,3	3	1970	8,6	5,5	3,1
		β	2	11	0,09														
	250	α	2	80	0,50	102	0,4	27	0,1	53	0,23	1	710	3,1	3	2650	11,5	4,2	4,2
		β	2	11	0,09														
	375	α	3	120	0,70	147	0,6	27	0,1	79	0,34	1	1090	4,7	3	4160	18,1	11,5	6,6
		β	3	16	0,14														
	MT	α	2	80	0,50	131	0,6	27	0,1	/	/	1	620	2,7	3	2250	9,8	6,1	3,5
		β	2	11	0,09														

MODELES MODELS MODELLE	L		**Ventilateurs** *Fans* Ventilatori			**Cordons chauffants** *Heaters* Antiappannanti		**Dégivrage** *Defrost* sbrinamento		
			230 V mono 50 Hz							
			Nr	W	A	W(1)	A	Nr	W	A
LEOPARD TN	**188**	α	2	80	0,50	39	0,17	2	540	2,3
		β	2	11	0,09					
	250	α	2	80	0,50	53	0,23	2	730	3,2
		β	2	11	0,09					
	375	α	3	120	0,75	79	0,34	2	1160	5,0
		β	3	16	0,14					
	MT	α	2	80	0,50	88	0,38	2	620	2,7
		β	2	11	0,09					

W(1)= Standard */ Standard* / Standard

W(2)= 1 joue panoramique */ 1 glass end wall* / 1 spalla panoramica

W(3)= Utilisé avec rideau de nuit / *Used with night curtain* / Utilizzate con tende notte

H-

CARACTERISTIQUES DETENDEURS THERMOSTATIQUES MARQUE DANFOSS - SANS MOP - GAMME B - AVEC ADAPTATEUR A BRASER

THERMOSTATIC EXPANSION VALVES REQUIREMENTS TRADE MARK DANFOSS - WITHOUT MOP - RANGE B - WITH BRAZING ADAPTER

CARATTERISTICHE DELLA VALVOLA TERMOSTATICA TIPO DANFOSS - SENZA MOP - GAMMA B - CON ADATTATORE A BRASARE

Règles de sélection :

- **puissance frigorifique utile et température d'évaporation en chambre d'essai à 25 °C 60% HR classe 3 ;**
- **pression de condensation correspondant à la température à + 35 °C ;**
- **sous-refroidissements de 10 K / 30 K.**

Selection rules :

- *useful refrigeration capacity and test room evaporation temperature of 25 °C 60% RH class 3 ;*
- *condensation pressure corresponding to temperature of + 35 °C ;*
- *subcoolings 10 K / 30 K.*

Regole di selezione:

- Potenza frigorifera utile e temperatura di evaporazione in camera di prova a 25 °C 60% UR classe 3;
- Pressione di condensazione corrispondente alla temperatura di +35 °C;
- Sottoraffreddamenti di 10 K / 30 K.

		R404A			
		Gamme *Range* Gamma **- B**			
		10 K		*30 K*	
M	**L**	**TYPE** *MODEL* TIPO	**ORIFICE** *ORIFICE* ORIFICIO	**TYPE** *MODEL* TIPO	**ORIFICE** *ORIFICE* ORIFICIO
LEOPARD	**188**	**TES2**	**01**	*TES2*	*00*
	250		**01**		*01*
	375		**02**		*02*
	TG		**01**		*01*
WHALE 1000 G	**250**		**01**		*01*
	375		**03**		*02*
WHALE 1500 G	**250**		**02**		*01*
	375		**03**		*03*
WHALE 1500 NP	**250**		**02**		*01*
	375		**03**		*02*
WHALE 2000 G	**188**		**02**		*01*
	250		**03**		*02*
	375		**04**		*03*
	TG		**01**		*00*
WHALE 2000 G 2EV	**188**		**02**		*01*
	250		**03**		*02*
	375		**04**		*03*
	TG		**01**		*00*

Les données frigorifiques sont établies pour des meubles ayant des détendeurs réglés pour obtenir une surchauffe de l'ordre de 5 K.

The data are given for cabinets having expansion valves adapted for having a superheat temperature of 5 K.

.I dati frigoriferi fanno riferimento ai mobili con valvola termostatica regolata per avere un surriscaldamento di 5K

H- (T°+)

CARACTERISTIQUES DETENDEURS THERMOSTATIQUES MARQUE DANFOSS - SANS MOP - GAMME N - AVEC ADAPTATEUR A BRASER

THERMOSTATIC EXPANSION VALVES REQUIREMENTS TRADE MARK DANFOSS - WITHOUT MOP - RANGE N - WITH BRAZING ADAPTER

CARATTERISTICHE DELLA VALVOLA TERMOSTATICA TIPO DANFOSS - SENZA MOP - GAMMA N - CON ADATTATORE A BRASARE

Règles de sélection :
- **puissance frigorifique utile et température d'évaporation en chambre d'essai à 25 °C 60% HR classe 3 ;**
- **pression de condensation correspondant à la température à + 35 °C ;**
- **sous-refroidissement de 10 K.**

Selection rules :
- *useful refrigeration capacity and test room evaporation temperature of 25 °C 60% RH class 3 ;*
- *condensation pressure corresponding to temperature of + 35 °C ;*
- *subcooling 10 K.*

Regole di selezione:
- Potenza frigorifera utile e temperatura di evaporazione in camera di prova a 25°C 60% UR classe 3;
- Pressione di condensazione corrispondente alla temperatura di +35°C;
- Sottoraffreddamento di 10K.

		R404A	
		Gamme *Range* Gamma **- N**	
M	**L**	**TYPE** *MODEL* TIPO	**ORIFICE** *ORIFICE* ORIFICIO
LEOPARD	**188**	**TES2**	**00**
	250		**00**
	375		**01**
	TG		**00**
WHALE 1000 G	**250**		**00**
	375		**01**
WHALE 1500 G	**250**		**00**
	375		**01**
WHALE 1500 NP	**250**		**00**
	375		**01**
WHALE 2000 G	**188**		**00**
	250		**01**
	375		**01**
	TG		**00**
WHALE 2000 G 2EV	**188**		**00**
	250		**01**
	375		**01**
	TG		**00**

Les données frigorifiques sont établies pour des meubles ayant des détendeurs réglés pour obtenir une surchauffe de l'ordre de 5 K.

The data are given for cabinets having expansion valves adapted for having a superheat temperature of 5 K.

I dati frigoriferi fanno riferimento ai mobili con valvola termostatica regolata per avere un surriscaldamento di 5K

CARACTERISTIQUES DETENDEURS ELECTRONIQUES MARQUE DANFOSS

H-

ELECTRONIC EXPANSION VALVES REQUIREMENTS TRADE MARK DANFOSS

CARATTERISTICHE DELLA VALVOLA ELETTRONICA MARCA DANFOSS

Règles de sélection :

- **puissance frigorifique utile et température d'évaporation en chambre d'essai à 25 °C 60% HR classe 3 ;**
- **pression de condensation correspondant à la température de + 35 °C ;**
- **sous-refroidissement de 10 K / 30 K ;**
- **prise en compte de la surcapacité de 60% et du degré d'ouverture de la vanne compris entre 50 et 75% maxi conseillés par DANFOSS.**

Selection rules :

- *useful refrigeration capacity and test room evaporation temperature of 25 °C 60% RH class 3 ;*
- *condensation pressure corresponding to temperature of + 35 °C ;*
- *subcooling 10 K / 30 K;*
- *provision for 60% of overcapacity and valve opening between 50 and 75% max as recommanded by DANFOSS.*

Regole di selezione :

- potenza frigorifera utile alla temperatura d'evaporazione in camera di prova a 25°C 60%UR classe3;
- pressione di condensazione corrispondente alla temperatura di 35°C;
- sottoraffreddamento 10 K / 30 K ;
- sovra capacità del 60% e grado di apertura compreso tra 50 e 75% massimo consigliato da DANFOSS.

		R404A		
M	**L**	**TYPE** *MODEL* TIPO	**ORIFICE** *ORIFICE* ORIFICIO	
			Sous-refroidissement *Subcooling* Sottoraffreddamento	
			10 K	*30 K*
LEOPARD	**188**	**AKV 10**	**2**	*2*
	250		**3**	*2*
	375		**4**	*3*
	TG		**3**	*2*
WHALE 1000 G	**250**		**3**	*2*
	375		**4**	*3*
WHALE 1500 G	**250**		**3**	*3*
	375		**4**	*4*
WHALE 1500 NP	**250**		**3**	*2*
	375		**4**	*3*
WHALE 2000 G	**188**		**3**	*3*
	250		**4**	*3*
	375		**5**	*4*
	TG		**2**	*2*
WHALE 2000 G 2EV	**188**		**3**	*3*
	250		**4**	*3*
	375		**5**	*4*
	TG		**2**	*2*

Les données frigorifiques sont établies pour des meubles ayant des détendeurs réglés pour obtenir une surchauffe de l'ordre de 5 K.

The data are given for cabinets having expansion valves adapted for having a superheat temperature of 5 K.

I dati frigoriferi fanno riferimento ai mobili con valvola termostatica regolata per avere un surriscaldamento di 5K

H- (T+)

CARACTERISTIQUES DETENDEURS ELECTRONIQUES MARQUE DANFOSS

ELECTRONIC EXPANSION VALVES REQUIREMENTS TRADE MARK DANFOSS

CARATTERISTICHE DELLA VALVOLA ELETTRONICA MARCA DANFOSS

Règles de sélection :

- **puissance frigorifique utile et température d'évaporation en chambre d'essai à 25 °C 60% HR classe 3 ;**
- **pression de condensation correspondant à la température de + 35 °C ;**
- **sous-refroidissement de 10 K / 30 K ;**
- **prise en compte de la surcapacité de 25% et du degré d'ouverture de la vanne compris entre 50 et 75% maxi conseillés par DANFOSS.**

Selection rules :

- *useful refrigeration capacity and test room evaporation temperature of 25 °C 60% RH class 3 ;*
- *condensation pressure corresponding to temperature of + 35 °C ;*
- *subcooling 10 K / 30 K;*
- *provision for 25% of overcapacity and valve opening between 50 and 75% max as recommanded by DANFOSS.*

Regole di selezione :

- potenza frigorifera utile alla temperatura d'evaporazione in camera di prova a 25°C 60%UR classe3;
- pressione di condensazione corrispondente alla temperatura di 35°C;
- sottoraffreddamento 10 K / 30 K ;
- sovra capacità del 25% e grado di apertura compreso tra 50 e 75% massimo consigliato da DANFOSS.

		R404A	
M	**L**	**TYPE** *MODEL* TIPO	**ORIFICE** *ORIFICE* ORIFICIO
LEOPARD	**188**	**AKV 10**	**1**
	250		**1**
	375		**2**
	TG		**1**
WHALE 1000 G	**250**		**1**
	375		**2**
WHALE 1500 G	**250**		**2**
	375		**3**
WHALE 1500 NP	**250**		**2**
	375		**2**
WHALE 2000 G	**188**		**2**
	250		**3**
	375		**4**
	TG		**1**
WHALE 2000 G 2EV	**188**		**2**
	250		**3**
	375		**4**
	TG		**1**

Les données frigorifiques sont établies pour des meubles ayant des détendeurs réglés pour obtenir une surchauffe de l'ordre de 5 K.

The data are given for cabinets having expansion valves adapted for having a superheat temperature of 5 K.

I dati frigoriferi fanno riferimento ai mobili con valvola termostatica regolata per avere un surriscaldamento di 5K

H-

CARACTERISTIQUES DETENDEURS THERMOSTATIQUES MARQUE DANFOSS - SANS MOP - GAMME B - AVEC ADAPTATEUR A BRASER

THERMOSTATIC EXPANSION VALVES REQUIREMENTS TRADE MARK DANFOSS - WITHOUT MOP - RANGE B - WITH BRAZING ADAPTER

CARATTERISTICHE DELLA VALVOLA TERMOSTATICA TIPO DANFOSS - SENZA MOP - GAMMA B - CON ADATTATORE A BRASARE

Règles de sélection :
- **puissance frigorifique utile et température d'évaporation en chambre d'essai à 25 °C 60% HR classe 3 ;**
- **pression de condensation correspondant à la température à + 35 °C ;**
- **sous-refroidissemenst de 10 K / 30 K.**

Selection rules :
- *useful refrigeration capacity and test room evaporation temperature of 25 °C 60% RH class 3 ;*
- *condensation pressure corresponding to temperature of + 35 °C ;*
- *subcoolings 10 K / 30 K.*

Regole di selezione:
- Potenza frigorifera utile e temperatura di evaporazione in camera di prova a 25 °C 60% UR classe 3;
- Pressione di condensazione corrispondente alla temperatura di +35 °C;
- Sottoraffreddamenti di 10 K / 30 K.

		R22			
		Gamme *Range* Gamma **- B**			
		10 K		*30 K*	
M	**L**	**TYPE** *MODEL* TIPO	**ORIFICE** *ORIFICE* ORIFICIO	**TYPE** *MODEL* TIPO	**ORIFICE** *ORIFICE* ORIFICIO
LEOPARD	**188**	**TEX2**	**00**	*TEX2*	*00*
	250		**00**		*00*
	375		**01**		*01*
	TG		**00**		*00*
WHALE 1000 G	**250**		**00**		*00*
	375		**01**		*01*
WHALE 1500 G	**250**		**01**		*01*
	375		**02**		*02*
WHALE 1500 NP	**250**		**01**		*00*
	375		**02**		*01*
WHALE 2000 G	**188**		**01**		*01*
	250		**02**		*01*
	375		**03**		*03*
	TG		**00**		*00*
WHALE 2000 G 2EV	**188**		**01**		*01*
	250		**02**		*01*
	375		**03**		*03*
	TG		**00**		*00*

Les données frigorifiques sont établies pour des meubles ayant des détendeurs réglés pour obtenir une surchauffe de l'ordre de 5 K.

The data are given for cabinets having expansion valves adapted for having a superheat temperature of 5 K.

I dati frigoriferi fanno riferimento ai mobili con valvola termostatica regolata per avere un surriscaldamento di 5K

H- (T°+)

CARACTERISTIQUES DETENDEURS THERMOSTATIQUES MARQUE DANFOSS - SANS MOP - GAMME N - AVEC ADAPTATEUR A BRASER

THERMOSTATIC EXPANSION VALVES REQUIREMENTS TRADE MARK DANFOSS - WITHOUT MOP - RANGE N - WITH BRAZING ADAPTER

CARATTERISTICHE DELLA VALVOLA TERMOSTATICA TIPO DANFOSS - SENZA MOP - GAMMA N - CON ADATTATORE A BRASARE

Règles de sélection :
- **puissance frigorifique utile et température d'évaporation en chambre d'essai à 25 °C 60% HR classe 3 ;**
- **pression de condensation correspondant à la température à + 35 °C ;**
- **sous-refroidissement de 10 K.**

Selection rules :
- *useful refrigeration capacity and test room evaporation temperature of 25 °C 60% RH class 3 ;*
- *condensation pressure corresponding to temperature of + 35 °C ;*
- *subcooling 10 K.*

Regole di selezione:
- Potenza frigorifera utile e temperatura di evaporazione in camera di prova a 25°C 60% UR classe 3;
- Pressione di condensazione corrispondente alla temperatura di +35°C;
- Sottoraffreddamento di 10K.

		R22	
		Gamme *Range* Gamma **- N**	
M	**L**	**TYPE** *MODEL* TIPO	**ORIFICE** *ORIFICE* ORIFICIO
LEOPARD	**188**	**TEX2**	**0X**
	250		**00**
	375		**00**
	TG		**0X**
WHALE 1000 G	**250**		**00**
	375		**00**
WHALE 1500 G	**250**		**00**
	375		**01**
WHALE 1500 NP	**250**		**00**
	375		**00**
WHALE 2000 G	**188**		**00**
	250		**00**
	375		**01**
	T		**0X**
WHALE 2000 G 2EV	**188**		**00**
	250		**00**
	375		**01**
	TG		**0X**

Les données frigorifiques sont établies pour des meubles ayant des détendeurs réglés pour obtenir une surchauffe de l'ordre de 5 K.

The data are given for cabinets having expansion valves adapted for having a superheat temperature of 5 K.

I dati frigoriferi fanno riferimento ai mobili con valvola termostatica regolata per avere un surriscaldamento di 5K

CARACTERISTIQUES DETENDEURS ELECTRONIQUES MARQUE DANFOSS

H-

ELECTRONIC EXPANSION VALVES REQUIREMENTS TRADE MARK DANFOSS

CARATTERISTICHE DELLA VALVOLA ELETTRONICA MARCA DANFOSS

Règles de sélection :

- **puissance frigorifique utile et température d'évaporation en chambre d'essai à 25 °C 60% HR classe 3 ;**
- **pression de condensation correspondant à la température de + 35 °C ;**
- **sous-refroidissement de 10 K / 30 K ;**
- **prise en compte de la surcapacité de 60% et du degré d'ouverture de la vanne compris entre 50 et 75% maxi conseillés par DANFOSS.**

Selection rules :

- *useful refrigeration capacity and test room evaporation temperature of 25 °C 60% RH class 3 ;*
- *condensation pressure corresponding to temperature of + 35 °C ;*
- *subcooling 10 K / 30 K;*
- *provision for 60% of overcapacity and valve opening between 50 and 75% max as recommanded by DANFOSS.*

Regole di selezione :

- potenza frigorifera utile alla temperatura d'evaporazione in camera di prova a 25°C 60%UR classe3;
- pressione di condensazione corrispondente alla temperatura di 35°C;
- sottoraffreddamento 10 K / 30 K;
- sovra capacità del 60% e grado di apertura compreso tra 50 e 75% massimo consigliato da DANFOSS.

		R22		
M	**L**	**TYPE** *MODEL* TIPO	**ORIFICE** *ORIFICE* ORIFICIO	
			Sous-refroidissement *Subcooling* Sottoraffreddamento	
			10 K	*30 K*
LEOPARD	**188**	**AKV 10**	**1**	*1*
	250		**2**	*2*
	375		**3**	*3*
	TG		**2**	*1*
WHALE 1000 G	**250**		**2**	*2*
	375		**3**	*3*
WHALE 1500 G	**250**		**3**	*2*
	375		**4**	*3*
WHALE 1500 NP	**250**		**2**	*2*
	375		**3**	*3*
WHALE 2000 G	**188**		**3**	*2*
	250		**3**	*3*
	375		**4**	*4*
	TG		**2**	*1*
WHALE 2000 G 2EV	**188**		**3**	*2*
	250		**3**	*3*
	375		**4**	*4*
	TG		**2**	*1*

Les données frigorifiques sont établies pour des meubles ayant des détendeurs réglés pour obtenir une surchauffe de l'ordre de 5 K.

The data are given for cabinets having expansion valves adapted for having a superheat temperature of 5 K.

I dati frigoriferi fanno riferimento ai mobili con valvola termostatica regolata per avere un surriscaldamento di 5K

CARACTERISTIQUES DETENDEURS ELECTRONIQUES MARQUE DANFOSS

H- (T°+)

ELECTRONIC EXPANSION VALVES REQUIREMENTS TRADE MARK DANFOSS

CARATTERISTICHE DELLA VALVOLA ELETTRONICA MARCA DANFOSS

Règles de sélection :

- **puissance frigorifique utile et température d'évaporation en chambre d'essai à 25 °C 60% HR classe 3 ;**
- **pression de condensation correspondant à la température de + 35 °C ;**
- **sous-refroidissement de 10 K ;**
- **prise en compte de la surcapacité de 25% et du degré d'ouverture de la vanne compris entre 50 et 75% maxi conseillés par DANFOSS.**

Selection rules :

- *useful refrigeration capacity and test room evaporation temperature of 25 °C 60% RH class 3 ;*
- *condensation pressure corresponding to temperature of + 35 °C ;*
- *subcooling 10 K;*
- *provision for 25% of overcapacity and valve opening between 50 and 75% max as recommanded by DANFOSS.*

Regole di selezione :

- potenza frigorifera utile alla temperatura d'evaporazione in camera di prova a 25°C 60%UR classe3;
- pressione di condensazione corrispondente alla temperatura di 35°C;
- sottoraffreddamento 10 K;
- sovra capacità del 25% e grado di apertura compreso tra 50 e 75% massimo consigliato da DANFOSS.

		R22	
M	**L**	**TYPE** *MODEL* TIPO	**ORIFICE** *ORIFICE* ORIFICIO
LEOPARD	**188**	**AKV 10**	**1**
	250		**2**
	375		**3**
	TG		**2**
WHALE 1000 G	**250**		**2**
	375		**3**
WHALE 1500 G	**250**		**2**
	375		**3**
WHALE 1500 NP	**250**		**2**
	375		**3**
WHALE 2000 G	**188**		**3**
	250		**3**
	375		**4**
	TG		**1**
WHALE 2000 G 2EV	**188**		**3**
	250		**3**
	375		**4**
	TG		**1**

Les données frigorifiques sont établies pour des meubles ayant des détendeurs réglés pour obtenir une surchauffe de l'ordre de 5 K.

The data are given for cabinets having expansion valves adapted for having a superheat temperature of 5 K.

I dati frigoriferi fanno riferimento ai mobili con valvola termostatica regolata per avere un surriscaldamento di 5K

Settings for Controller EKC414_A For timer PTC1000
Referred to climate class 3 in accordance with EN441

OTHER PARAMETERS	DISPLAY	UNITA'	Leopard TN	Leopard BT
Sout set point		**°C**	**-8°**	**-32°**
THERMOSTAT				
Differential	r01	K	4	4
Maximum programmable set point value	r02	°C	10°	-20°
Minimum programmable set point value	r03	°C	-15°	-40°
Temperature unit 0=°C , 1=°F	r05	\	°C	°C
Calibration of probe S4(Sout)	r09	K	0	0
Calibration of probe S3(Sin)	r10	K	0	0
Controller switch	r12	\	ON	ON
Night offset	r13	K	0	0
Operation mode 1=ON/OFF, 2=Modulating	r14	\	1	1
Temperature control probe 100%=S4 (Sout) , 0%=S3(Sin)	r15	%	100	100
Melt interval	r16	h	0	0
Melt interval	r17	min	0	0
ALARMS				
Temperature alarm delay	A03	min	30	30
Door open alarm delay	A04	min	60	60
Pulldown alarm delay	A12	min	120	120
Top temperature limit	A13	°C	2	-22°
Bottom temperature limit	A14	°C	-14°	-38°
COMPRESSOR				
Minimum on time	c01	min	0	0
Minimum off time	c02	min	0	0
DEFROST				
Defrost-end temperature	d02	°C	5°	5°
Interval between defrosts	d03	h	12	12
Maximum defrost duration	d04	min	45	45
Defrost start delay	d05	min	0	0
Drip-off time	d06	min	0	0
Fans start delay after defrost end	d07	min	0	0
Fans start temperature	d08	°C	-15	-15
Fans ON while defrosting	d09	\	YES	YES
Defrost-end probe 0=S4(Sout) , 1=S5(Sdef) , 2= End of time-controlled defros	d10	\	1	1
Defrost start on power-up	d13	\	NO	NO
INJECTION				
Maximum suction superheat value	n09	K	5	5
Minimum suction superheat value	n10	K	3	3
MOP temperature	n11	°C	OFF	OFF
AKV pulse period	n13	sec	6	6
Stability	n18	\	\	\
Forced AKV closing	n36	\	OFF	OFF
FANS				
Fans off when compressor is off	F01	\	NO	NO
Fan stop delayed on compressor stop	F02	min	0	0
Fan stop temperature when operating with S5(Sdef) -50 , 50/Off	F04	\	OFF	OFF
OTHER FUNCTIONS				
Output signal delay on controller power up	o01	sec	5	5
DI input signal (off=not used ;1=door;2=defrost;3=night;4=main switch;5=slave in)	o02	\	2	2
Address (0-60)	o03		\	\
LON service pin(0=off,1=on)	o04		OFF	OFF
Password	o05		OFF	OFF
Probe type (0=Pt;1=PTC)	o06		1	1
Language (0=English:1=German;2=French;3=Danish;4=Spanish;5=Italian)	o11		5	5
Frequency 50-60 Hz	o12		50	50
DO output(off=not used, 1=Def.Master , 2=Def.Slave)	o13		0	0
Maximum stand-by after defrosting	o16	minutes	10	10
Probe on display reading S3(Sin)=0% , S4(Sout)=100%	o17		0%	0%
Relay manual control (1 = COMPRESSOR RELAY ON / 2 = DEFROST REL 3 = FAN RELAY ON / 4 = ALARM OFF / 5 = DO OUTPUT DO ON / 6 = AKV ON / 7=LIGHTS ON)	o18		OFF	OFF
Pressure transducer range - min.value (-1 bar…. 5bar)	o20	bar	*	*
Pressure transducer range - max.value (6 bar….36 bar)	o21	bar	*	*
ON Input control (1 = AVK OFF - FANS ON - ALARM / 2 = AKV OFF - FAN 3 = AKV OFF - FANS ON - NO ALARM / 4 = AKV OFF - FANS OFF - NO ALARM.	o29		\	\
Type of refrigerant (1=R12;2=R22;3=R134a;4=R502;5=R717;6=R13;7=R13b 11=R114;12=R142b;13=n.n;14=R32;15=R227;16=R401A;17=R507;18=R402A;19=R404A;20=R407C;21=R407A; 22=R407B;23=R410A;24=R170;25=R290;26=R600;27=R600a;R28=R744;29=R1270;30=R417A)	o30		*	*

Settings for controller EKC201C (with RTC + Pt1000)
Referred to climate class 3 in accordance with EN441

DESCRIPTION OF PARAMETERS	DISPLAY	UNIT	Default	Leopard TN	Leopard BT
THERMOSTAT					
Cout set point (Sout)	**OUT**	°C	3.0	**-8°**	**-32**
Temperature unit	r05		°C	°C	°C
Sout differential	**r07**	°C	2.0	**4**	**4**
Sin differential	r08	°C	2.0	2	2
Sout calibration	r09	°C	0.0	0	0
Sin calibration	r10	°C	0.0	0	0
Night set-point (Sin=OUT+r20)	**r20**	K	6.0	**0**	**0**
ALARMS					
Alarm delay	**A03**	MIN	10	30	30
Door alarm delay	A04	MIN	60	60	60
High temperature Sout	**A05**	°C	10	**10**	**10**
Low temperature Sout	**A06**	°C	-10	**-6**	**-6**
High temperature Sin	**A07**	°C	10	**21**	**21**
Low temperature Sin	**A08**	°C	-10	**0**	**0**
Sin further night temperature margin	A09	°C	10.0	10	10
COMPRESSORS					
Minimum on time	c01	MIN	0	0	0
Cut-in delay	c02	MIN	0	0	0
Operation cycle under probe failure	c03	%	50	50%	50%
Compressor off when door is open (yes/no)	c04		No	NO	NO
DEFROST					
Defrost type (no=el; yes=gas)	d01		NO	NO	NO
Defrost-end temperature	**d02**	°C	10°	**5°**	**5°**
Interval between defrosts	**d03**	hours	8	**12**	**12**
Maximum defrost duration	d04	minutes	45	45	45
Defrost offset time	d05	minutes	0	0	0
Drip-off time	d06	minutes	0	**0**	**0**
Fans start on defrost end	**d07**	minutes	0	**0**	**0**
Fans start temperature (>25=OFF)	**d08**	°C	25	**OFF**	**OFF**
Fans on when defrosting (0=no;1=yes)	d09		NO	YES	YES
Defrost probe (out=Sout;Def=Sdef)	d10		OUT	DEF	DEF
Alarm delay on defrost end	**d11**	minutes	90	**60**	**60**
Duration of reading DEF on display after defrost end	**d12**	minutes	1	**25**	**25**
Defrost start on power-up	d13		NO	NO	NO
DEFROST PROGRAMMING BY RTC					
Defrost start time (hour) 1	t01	hours	hours	OFF	OFF
Defrost start time 1 (minutes)	t12	minutes	minutes	0	0
Defrost start time 2 (hour)	t02	hours	hours	OFF	OFF
Defrost start time 2 (minutes)	t12	minutes	minutes	0	0
Defrost start time 3 (hour)	t03	hours	hours	OFF	OFF
Defrost start time 3 (minutes)	t13	minutes	minutes	0	0
Defrost start time 4 (hour)	t04	hours	hours	OFF	OFF
Defrost start time 4 (minutes)	t14	minutes	minutes	0	0
Defrost start time 5 (hour)	t05	hours	hours	OFF	OFF
Defrost start time 5 (minutes)	t15	minutes	minutes	0	0
Defrost start time 6 (hour)	t06	hours	hours	OFF	OFF
Defrost start time 6 (minutes)	t16	minutes	minutes	0	0
Adjustment of hour	t07	hours	hours	0	0
Adjustment of minutes	t08	minutes	minutes	0	0
FANS					
Fans off when compressor is off	F01		NO	NO	NO
Fan stop delayed on compressor stop	F02	minutes	0	0	0
Fans off when door is open (yes/no)	F03		YES	YES	YES
OTHER FUNCTIONS					
Output signal delay on thermostat power up	o01	sec	5	5	5
Signal on DI input *3)	**o02**		OFF	**5**	**5**
Address (0-60)	o03		0	0	0
LON service pin (0=off,1=on)	o04		OFF	OFF	OFF
Password	o05		OFF	OFF	OFF
Probe type (0=Pt;1=Ptc)	**o06**		Pt	**0**	**0**
Digital output *4)	o13	**Master**		1	1
	o13	**Slave**		2	2
Active probe (0=Aut;1=out)	**o14**		OUT	OUT	OUT
Display resolution (0=0,1°;1=0,5°)°C	o15		NO	NO	NO
Max. slave delay after defrost	o16	minutes	20	20	20
Probe displayed *5)	o17		In	IN	IN
Manual control of outputs *6)	o18		OFF	OFF	OFF
Relay configuration (Alarm / Lights)	o36		1	1	1

with serial

*3)off=not used ;1=bus;2=defrost;3=night;4=main switch;5=Slave defr.IN;6=door

*4)off=non used;1=master defr.out;2=slave defr. Out;

*5)aut=automatic day-night;Out= out probe;In= In probe

*6)OFF=Non-forced outputs;1=Comp.ON;2=Def ON;3=Fans ON;4=Alarm ON;5=Dig.ON

Settings for controller EKC101
Referred to climate class 3 in accordance with EN441

DESCRIPTION	PARAMETER	UNIT	**Leopard TN**	**Leopard BT**
TEMPERATURE CONTROLLER				
Set point		**°C**	**-8°**	**-32°**
Differential	**r1**	**K**	**4**	**4**
Max. programmable value	r2	°C	10°	-25°
Min. Programmable value	r3	°C	-15°	-38°
Probe reading compensation	r4	K	0	0
COMPRESSOR				
Min. On time	c1	minutes	0	0
Min. Off time	c2	minutes	0	0
Cyclic operation	c3	%	50%	50%
DEFROSTING				
Defrost-end temperature	d2	°C	OFF	OFF
Interval between defrosts	d3	hours	OFF	OFF
Maximum defrost duration	d4	minutes	45	45
Display reading delay on defrost end	d5	minutes	10	10
Defrost on power-up	d6		OFF	OFF
MISCELLANEOUS				
Output signal delay on controller power up	o1	minutes	0	0
Access code	o5		OFF	OFF
Refrigeration(rE) / Heating(HE)	o7		rE	rE

DEFROST-END THERMOSTAT/DEFROST END TEMPERATURE	5°C	5°C
TIME SETTING ON TIMER	45'	45'
NUMBER OF DEFROST EVENTS (24h)	2	2
FAN DELAY	0	0
DRIP OFF TIME	0	0

Settings for controller EKC414_A (With Con RTC + PT1000)
Referred to climate class 3 in accordance with EN441

DESCRIPTION OF PARAMETERS	DISPLAY	UNIT	Leopard TN	Leopard BT
Sout set point		**°C**	**-8°**	**-32°**
THERMOSTAT				
Differential	r01	K	4	4
Maximum programmable set point value	r02	°C	10°	-20°
Minimum programmable set point value	r03	°C	-15°	-40°
Temperature unit 0=°C , 1=°F	r05	\	°C	°C
Calibration of probe S4(Sout)	r09	K	0	0
Calibration of probe S3(Sin)	r10	K	0	0
Controller switch	r12	\	ON	ON
Night offset	r13	K	0	0
Operation mode 1=ON/OFF, 2=Modulating	r14	\	1	1
Temperature-control probe 100%=S4 (Sout) , 0%=S3(Sin)	r15	%	100	100
Melt interval	r16	h	0	0
Melt interval	r17	MIN	0	0
ALARMS				
Temperature alarm delay	A03	MIN	30	30
Door open alarm delay	A04	MIN	60	60
Pulldown alarm delay	A12	MIN	120	120
Top temperature limit	A13	°C	2	-22°
Bottom temperature limit	A14	°C	-14°	-38°
COMPRESSOR				
Minimum on time	c01	MIN	0	0
Minimum off time	c02	MIN	0	0
DEFROST				
Defrost-end temperature	d02	°C	5°	5°
Interval between defrosts	d03	h	12	12
Maximum defrost duration	d04	MIN	45	45
Defrost start delay	d05	MIN	0	0
Drip-off time	d06	MIN	0	0
Fans start delay after defrost end	d07	MIN	0	0
Fan start temperature	d08	°C	-15	-15
Fans ON while defrosting	d09	\	YES	YES
Defrost-end probe 0=S4(Sout) , 1=S5(Sdef) , 2= End of time-controlled defros	d10	\	1	1
Defrost start on power-up	d13	\	NO	NO
INJECTION				
Maximum suction superheat value	n09	K	5	5
Minimum suction superheat value	n10	K	3	3
MOP temperature	n11	°C	OFF	OFF
AKV pulse period	n13	sec	6	6
Stability	n18	\	\	\
Forced AKV closing	n36	\	OFF	OFF
FANS				
Fans off when compressor is off	F01	\	NO	NO
Fan stop delayed on compressor stop	F02	MIN	0	0
Fan stop temperature when operating with S5(Sdef) -50 , 50/Off	F04	\	OFF	OFF
OTHER FUNCTIONS				
Output signal delay on controller power up	o01	sec	5	5
DI input signal (off=not used ;1=door;2=defrost;3=night;4=main switch;5=slav	o02	\	5	5
Address (0-60)	o03		\	\
LON service pin (0=off,1=on)	o04		OFF	OFF
Password	o05		OFF	OFF
Probe type (0=Pt;1=PTC)	o06		**0**	**0**
Language (0=English:1=German;2=French;3=Danish;4=Spanish;5=Italian)	o11		5	5
Frequency 50-60 Hz	o12		50	50
DO digital output (off=not used, 1=Def.Master , 2=Def.Slave)	o13	**Master**	1	1
	o13	**Slave**	2	2
Maximum stand-by after defrosting	o16	minutes	10	10
Probe on display reading S3(Sin)=0% , S4(Sout)=100%	o17		0%	0%
Relay manual control (1 = COMPRESSOR RELAY ON / 2 = DEFROST REL 3 = FAN RELAY ON / 4 = ALARM OFF / 5 = DO OUTPUT DO ON / 6 = AKV ON / 7=LIGHTS ON)	o18		OFF	OFF
Pressure transducer range - min.value (-1 bar…. 5bar)	o20	bar	*	*
Pressure transducer range - max.value (6 bar….36 bar)	o21	bar	*	*
ON Input control (1 = AVK OFF - FANS ON - ALARM / 2 = AKV OFF - FAN 3 = AKV OFF - FANS ON - NO ALARM / 4 = AKV OFF - FANS OFF - NO ALARM.	o29		\	\
Type of refrigerant (1=R12;2=R22;3=R134a;4=R502;5=R717;6=R13;7=R13b 11=R114;12=R142b;13=n.n;14=R32;15=R227;16=R401A;17=R507;18=R402A;19=R404A;20=R407C;21=R407A; 22=R407B;23=R410A;24=R170;25=R290;26=R600;27=R600a;R28=R744;29=R1270;30=R417A)	o30		*	*

* =TO BE CONFIGURED ON SITE ACCORDING TO TRANSDUCER AND REFRIGERANT TYPE

Settings for controller EKC201C for ext. timer PTC1000
Referred to climate class 3 in accordance with EN441

DESCRIPTION OF PARAMETERS	DISPLAY	UNIT	Default	Leopard TN	Leopard BT
THERMOSTAT					
Cout set point (Sout)	**OUT**	°C	3.0	**-8°**	**-32**
Temperature unit	r05		°C	°C	°C
Sout differential	**r07**	°C	2.0	**4**	**4**
Sin differential	r08	°C	2.0	2	2
Sout calibration	r09	°C	0.0	0	0
Sin calibration	r10	°C	0.0	0	0
Night set-point (Sin=OUT+r20)	**r20**	K	6.0	**0**	**0**
ALARMS					
Alarm delay	**A03**	MIN	10	30	30
Door alarm delay	A04	MIN	60	60	60
High temperature Sout	**A05**	°C	10	**10**	**10**
Low temperature Sout	**A06**	°C	-10	**-6**	**-6**
High temperature Sin	**A07**	°C	10	**21**	**21**
Low temperature Sin	**A08**	°C	-10	**0**	**0**
Sin further night temperature margin	A09	°C	10.0	10	10
COMPRESSORS					
Minimum on time	c01	MIN	0	0	0
Cut-in delay	c02	MIN	0	0	0
Operation cycle under probe failure	c03	%	50	50%	50%
Compressor off when door is open (yes/no)	c04		NO	NO	NO
DEFROSTING					
Defrost type (no=el; yes=gas)	d01		NO	NO	NO
Defrost-end temperature	**d02**	°C	10°	**5°**	**5°**
Interval between defrosts	**d03**	hours	8	**12**	**12**
Maximum defrost duration	d04	minutes	45	45	45
Defrost offset time	d05	minutes	0	0	0
Drip-off time	d06	minutes	0	**0**	**0**
Fans start on defrost end	**d07**	minutes	0	**0**	**0**
Fan start temperature (>25=OFF)	**d08**	°C	25	**OFF**	**OFF**
Fans on when defrosting (0=no;1=yes)	d09		NO	YES	YES
Defrost probe (out=Sout;Def=Sdef)	d10		OUT	DEF	DEF
Alarm delay on defrost end	**d11**	minutes	90	**60**	**60**
Duration of reading DEF on display after defrost end	**d12**	minutes	1	**25**	**25**
Defrost start on power-up	d13		NO	NO	NO
DEFROST PROGRAMMING BY RTC					
Defrost start time 1	t01	hours	hours	OFF	OFF
Defrost start time 1 (minutes)	t12	minutes	minutes	0	0
Defrost start time 2	t02	hours	hours	OFF	OFF
Defrost start time 2 (minutes)	t12	minutes	minutes	0	0
Defrost start time 3	t03	hours	hours	OFF	OFF
Defrost start time 3 (minutes)	t13	minutes	minutes	0	0
Defrost start time 4	t04	hours	hours	OFF	OFF
Defrost start time 4 (minutes)	t14	minutes	minutes	0	0
Defrost start time 5	t05	hours	hours	OFF	OFF
Defrost start time 5 (minutes)	t15	minutes	minutes	0	0
Defrost start time 6	t06	hours	hours	OFF	OFF
Defrost start time 6 (minutes)	t16	minutes	minutes	0	0
Adjustment of hour	t07	hours	hours	0	0
Adjustment of minutes	t08	minutes	minutes	0	0
FANS					
Fans off when compressor is off	F01		NO	NO	NO
Fan stop delayed on compressor stop	F02	minutes	0	0	0
Fans off when door is open (yes/no)	F03		YES	YES	YES
OTHER FUNCTIONS					
Output signal delay on thermostat power up	o01	sec	5	5	5
Signal on DI digital input *3)	**o02**		OFF	**2**	**2**
Address (0-60)	o03		0	0	0
LON service pin (0=off,1=on)	o04		OFF	OFF	OFF
Password	o05		OFF	OFF	OFF
Probe type (0=Pt;1=Ptc)	**o06**		Pt	**1**	**1**
Digital output *4)	o13		OFF	OFF	OFF
Active probe (0=Aut;1=out)	**o14**		OUT	OUT	OUT
Display resolution (0=0,1°;1=0,5°)°C	o15		NO	NO	NO
Max. slave stand-by after defrost end	o16	minutes	20	20	20
Probe displayed *5)	o17		IN	IN	IN
Manual control of outputs *6)	o18		OFF	OFF	OFF
Relay configuration (Alarm / Lights)	o36		1	1	1

With serial

*3)off=not used ;1=bus;2=defrost;3=night;4=main switch;5=Slave defr.IN;6=door

*4)off=non used;1=master defr.out;2=slave defr. Out;

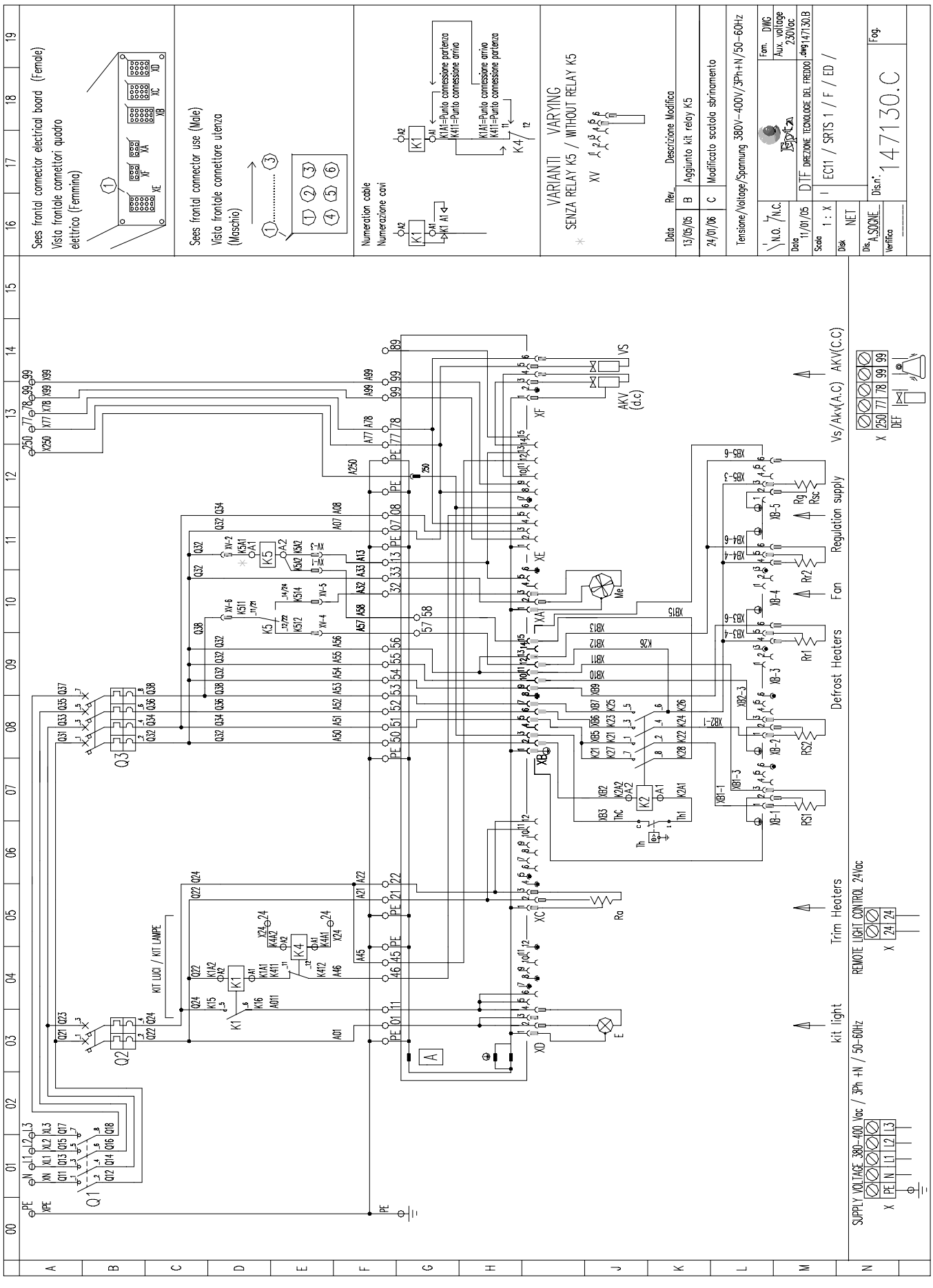
*5)aut=automatic day-night;Out= out probe;In= In probe

*6)OFF=Non-forced outputs;1=Comp.ON;2=Def ON;3=Fans ON;4=Alarm ON;5=Dig.ON

WIRING DIAGRAMS

	KEY TO THE WIRING DIAGRAM
XM-XN	Master-Slave Connector
Q2…	Automatic switch
Q1…	Main switch
E	Lamp
L	Suppression filter
Z	Compressor
Mt	Motor night blind
Ra1.....9	Demist heaters
Rp	Panel heaters
Rpt	Roof panel heaters
Rc	Frame canopy heater
Rv	Door and glass heaters
Rm	Mullions heaters
Rs1...4	Coil defrost heaters
Rg	Drip-tray defrost heaters
Rsc	Drain defrost heater
Rr	Heaters on air inlet
Rt	Fan delay timer
S4	Air outlet probe
S5	Defrost end probe
S3	Air inlet probe
T	Transformer
Ts	Defrost thermostat
Tf	Themperature control thermostat
Th	Thermal protection
Tv	Fans delay thermostat
DS	Defrost timer
QMt	Night blind switch
Me	Evaporator fan/s
Mf	Front fans
Ml	Side fans
Mv	Top fan
Vs	Solenoid valve
Mc1	Condenser fan/s
QE	Light switch
K	Motor blind contactor
K1	Lighting contactor
K2-3A-3B	Defrost contactor
K3	Defrost starting relay
K4	Light remote control relay
K5-6	Evaporator fan delay relay
K7	Air inlet heater contactor
	TERMINAL BOARD
1-2	Defrost end
3-4	Thermostat signal
4 / 77-78	Thermostat signal
5-6	Lights power supply
7-8	Demist heater power supply
7a-8a	Fan+controller power supply
9-10R.S.T	Defrost heater power supply
14	Cooling signal
15	Defrost start signal
16/250	Defrosting signal
18-19	Fan delay beginning signal
30-31	Solenoid valve power supply
99-99	Alarm clean contact
J-C	Thermostat signal
N-L	Showcase power supply 230V-50Hz
N-R-S-T	Showcase power supply 380-400V /3P+N/50H:
0-24V	Light remote control signal
a-a	Solenoid valve

COSTAN TECHNICAL DOCUMENTATION	CHAPTER REVISION STATUS				CONFORMS TO APPROVED ORIGINAL	PAGE: **1/13**
CABINET: **LEOPARD**	ORD.	DATE	ORD.	DATE		
CHAP. No.. **9** DOC No. **QSM000259E**	A	**20.02.06**	D			DATE OF 1ª ISSUE: **30.September.05**
CHAPTER: **WIRING DIAGRAMS**	B		E			
	C		F			



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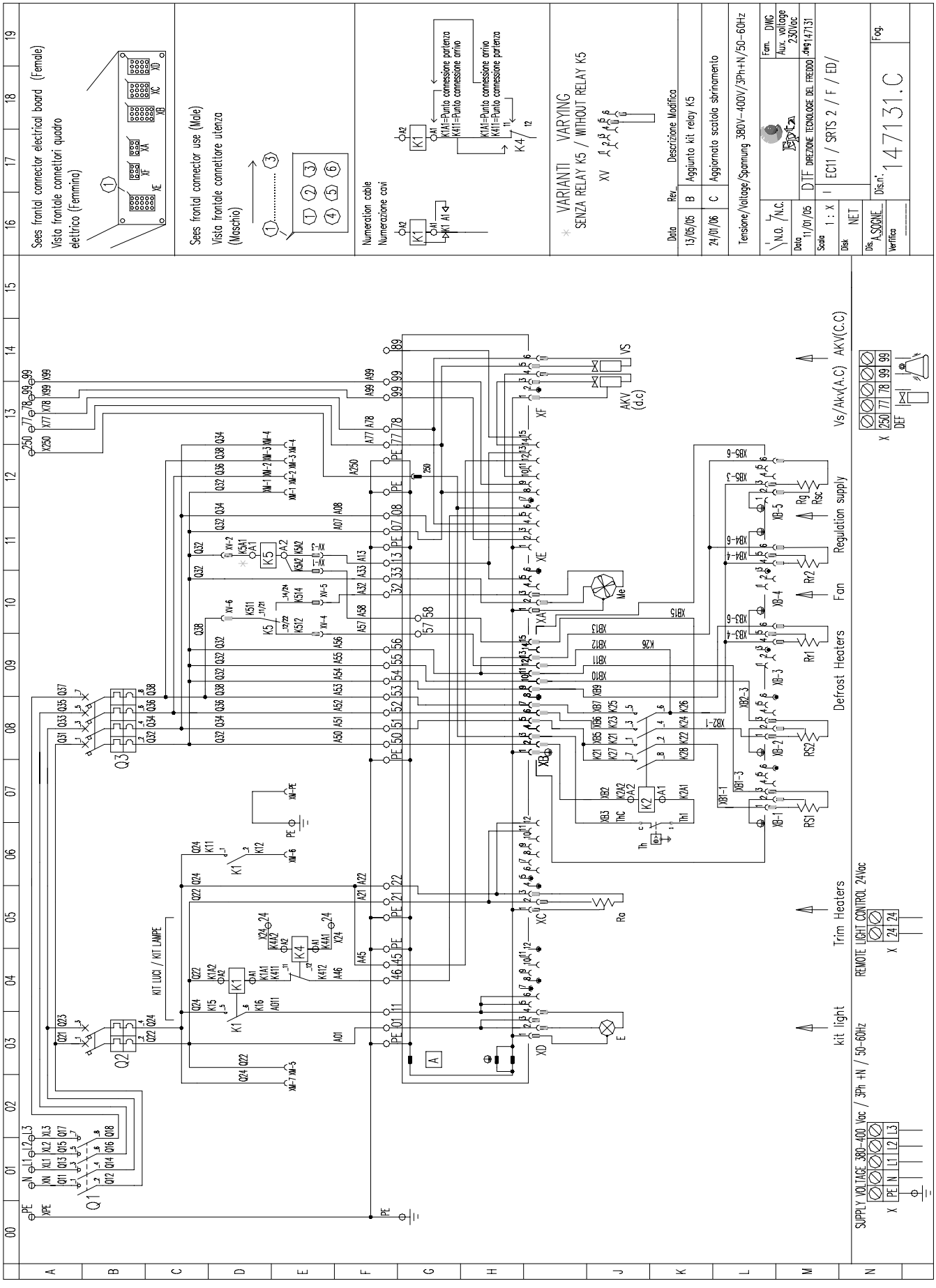

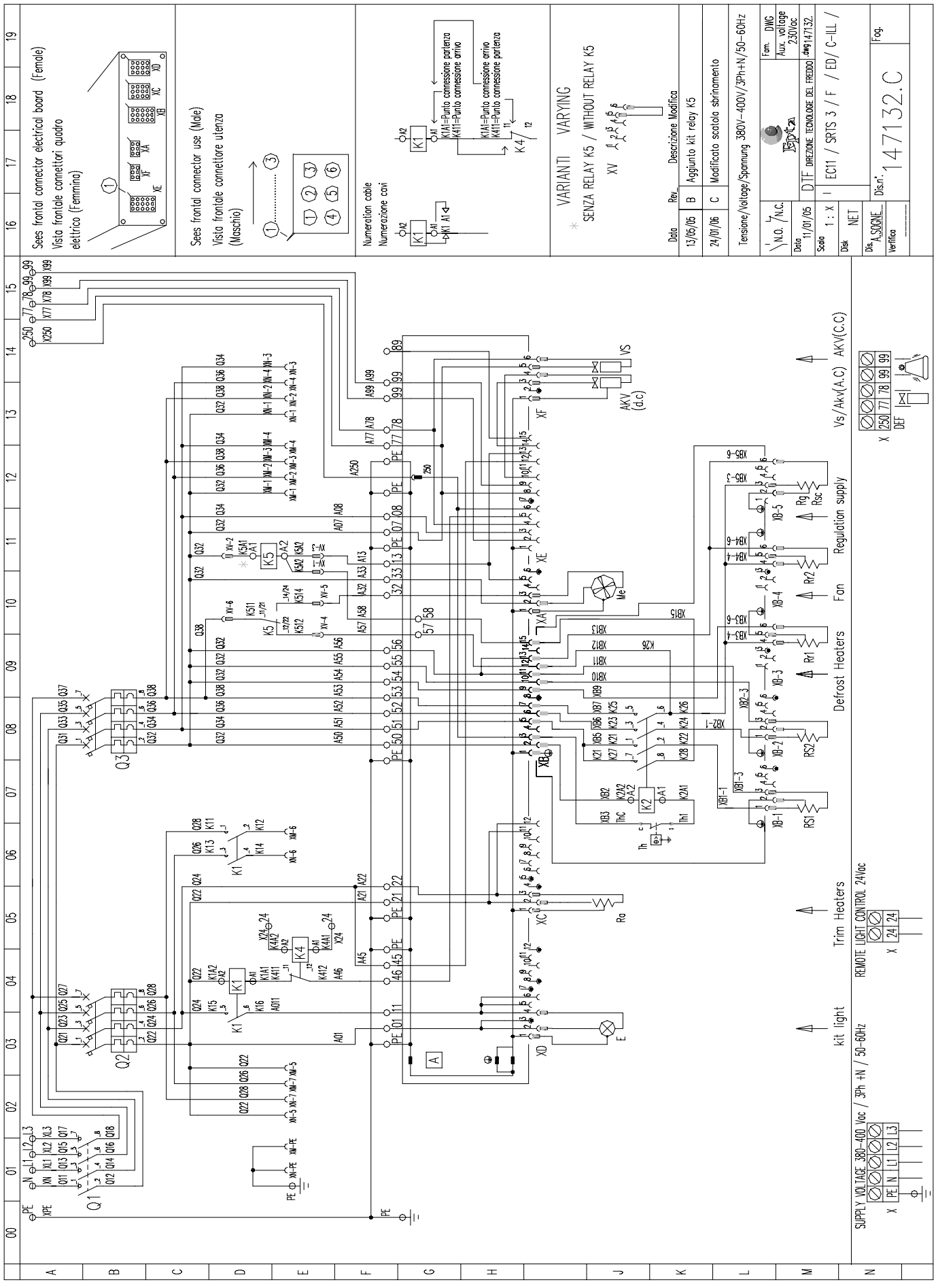
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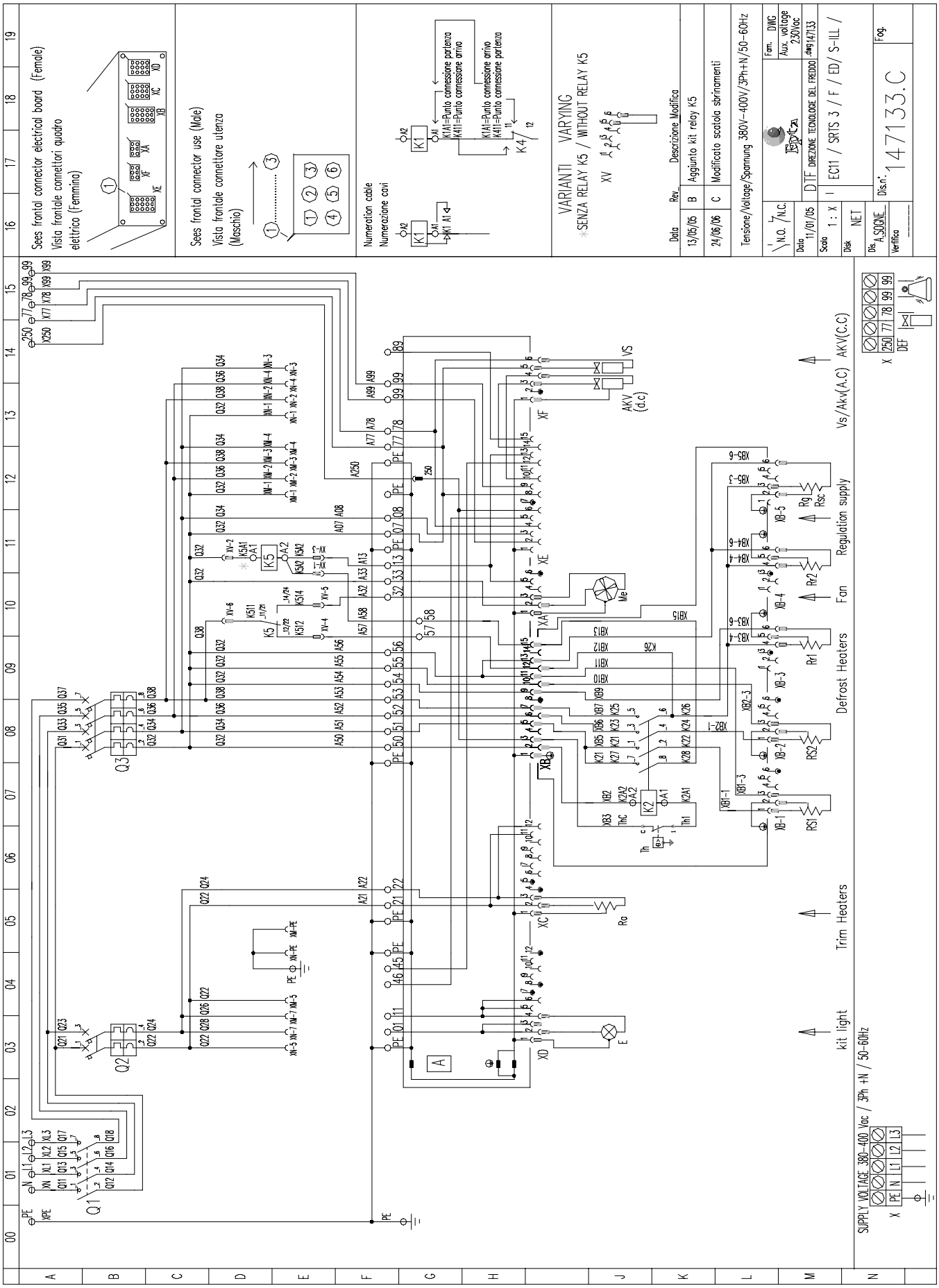
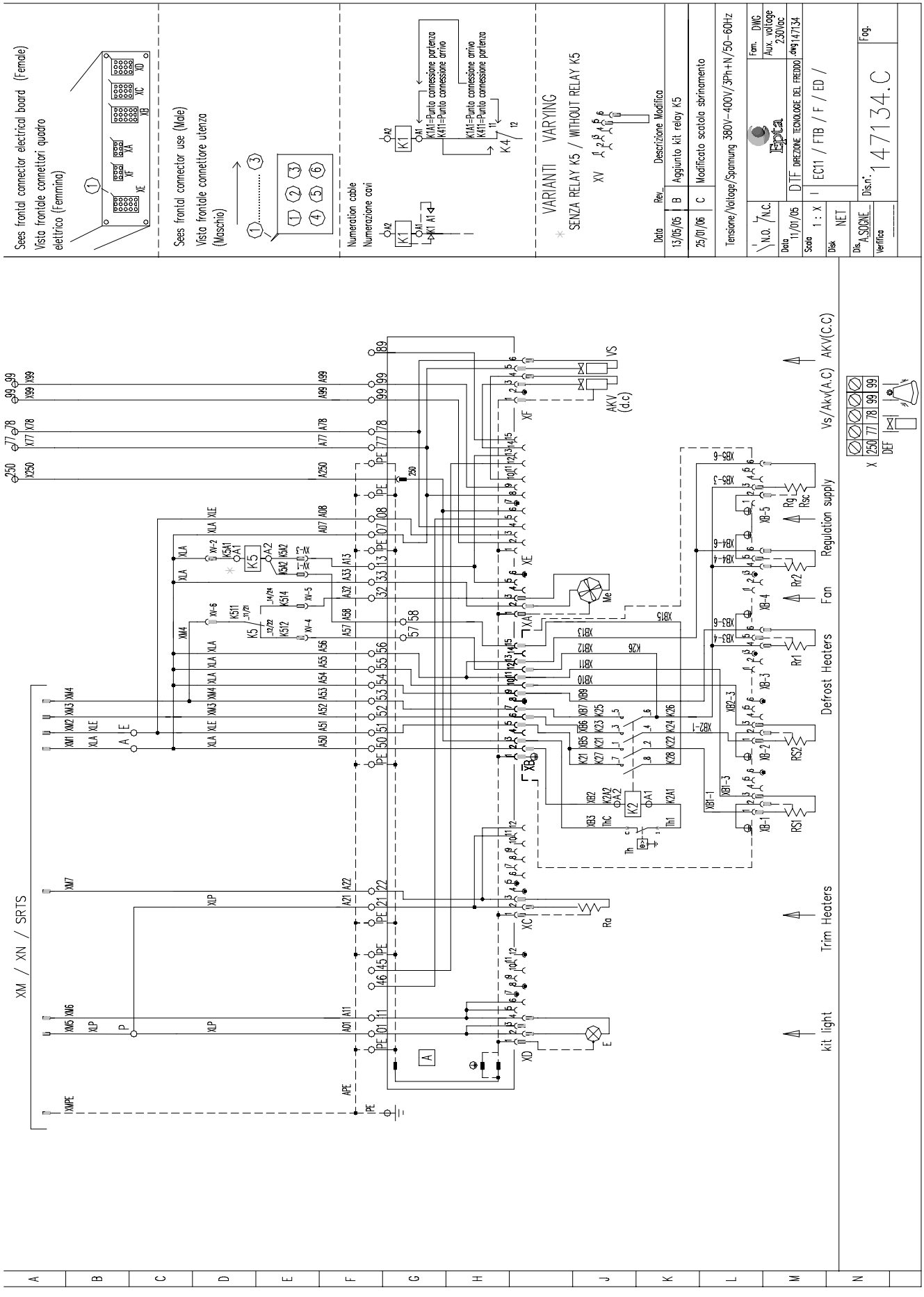
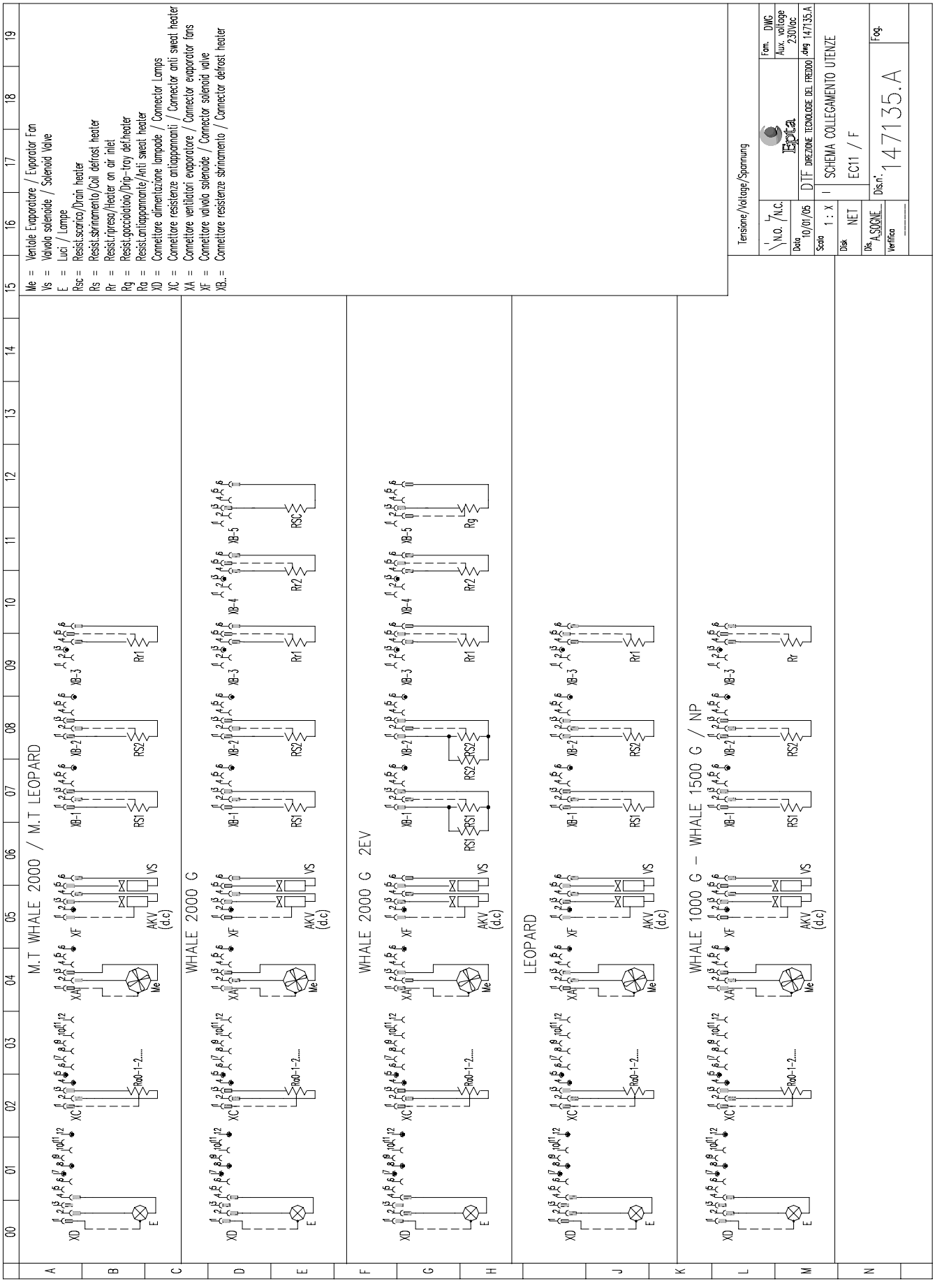
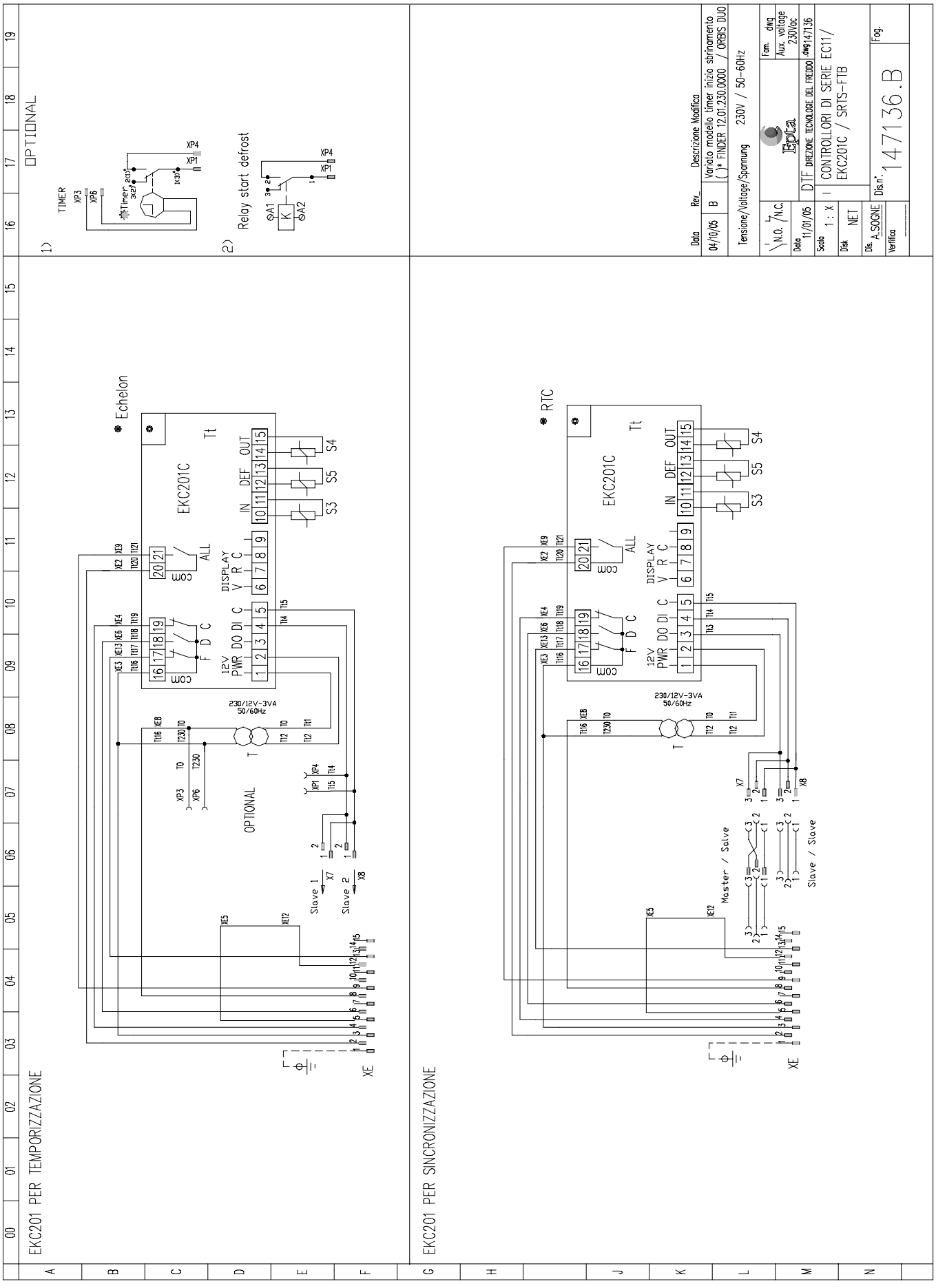
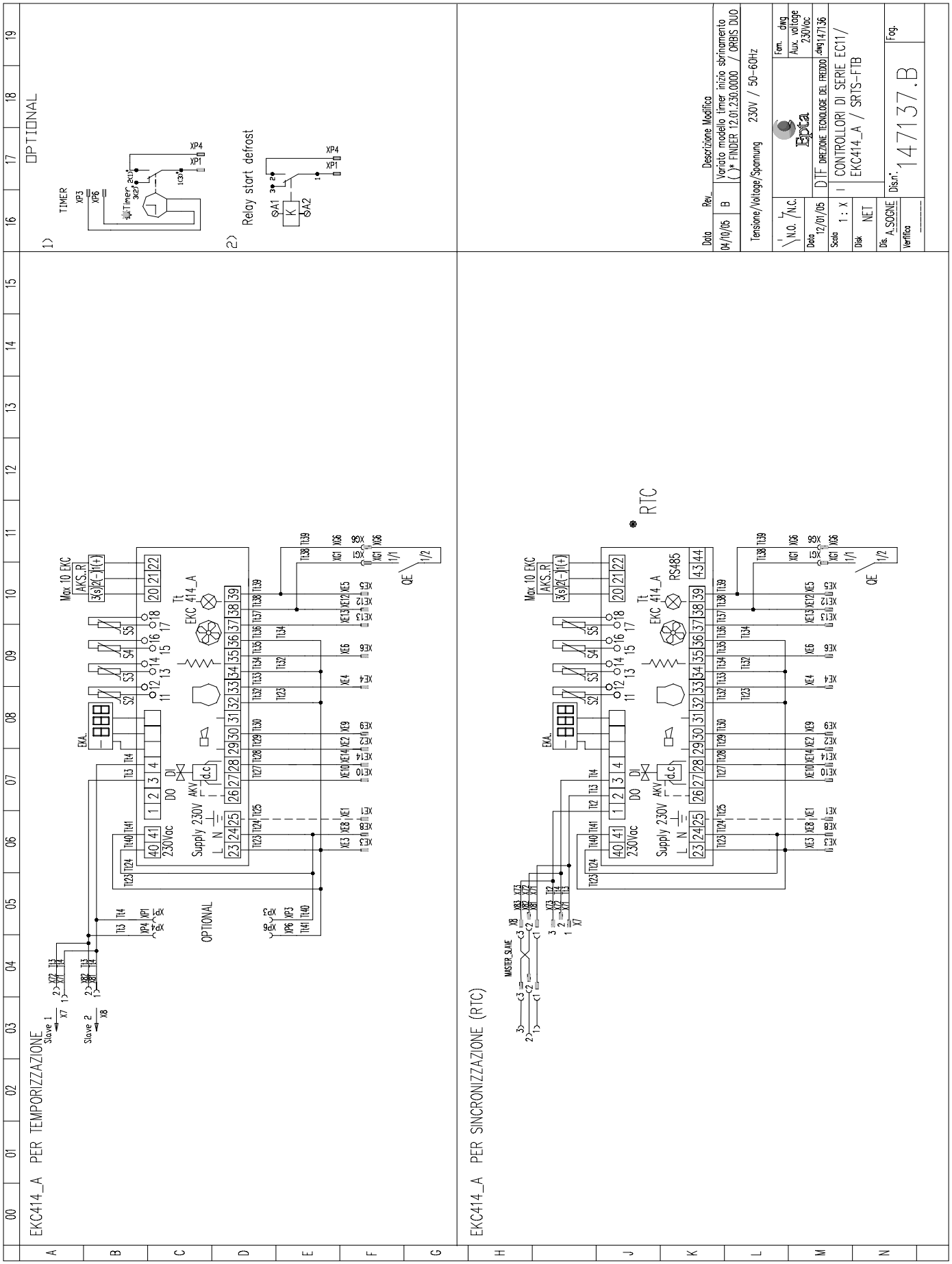
Vista frontale connettori quadro elettrico (Femmina)
Sees frontal connector use (Male)
Vista frontale connettore utenza (Maschio)
Numeration cable
Numerazione cavi
K1A1=Punto connessione partenza
K4I1=Punto connessione arrivo
K1A1=Punto connessione arrivo
K4I1=Punto connessione partenza
VARIANTI VARYING
SENZA RELAY K5 / WITHOUT RELAY K5
Data Rev. Descrizione Modifica
13/05/05 B Aggiunto kit relay K5
24/01/06 C Modificato scatola sbrinamento
Tensione/Voltage/Spannung 380V~400V/3Ph+N/50~60Hz
N.O. / N.C.
Data 11/01/05
Scala 1 : X
Disk NET
Dis.A.SCONE
Verifica
DTF DIREZIONE TECNOLOGIE DEL FREDDO
EC11 / SRTS 3 / F / ED/ C-ILL /
Dis.n.: 147132.C
Fam. DWG
Aux. voltage 230Vac
dwg147132.
Fog.
SUPPLY VOLTAGE 380-400 Vac / 3Ph +N / 50-60Hz
REMOTE LIGHT CONTROL 24Vac
kit light
Trim Heaters
Defrost Heaters
Fan
Regulation supply
Vs/Akv(A.C) AKV(C.C)
VS
AKV (d.c)
Me
E
Ra
Rr1
Rr2
Rsc
Rg
RS1
RS2
Th
Q1
Q2
Q3
K1
K2
K4
K5
XA
XB
XC
XD
XE
XF
DEF

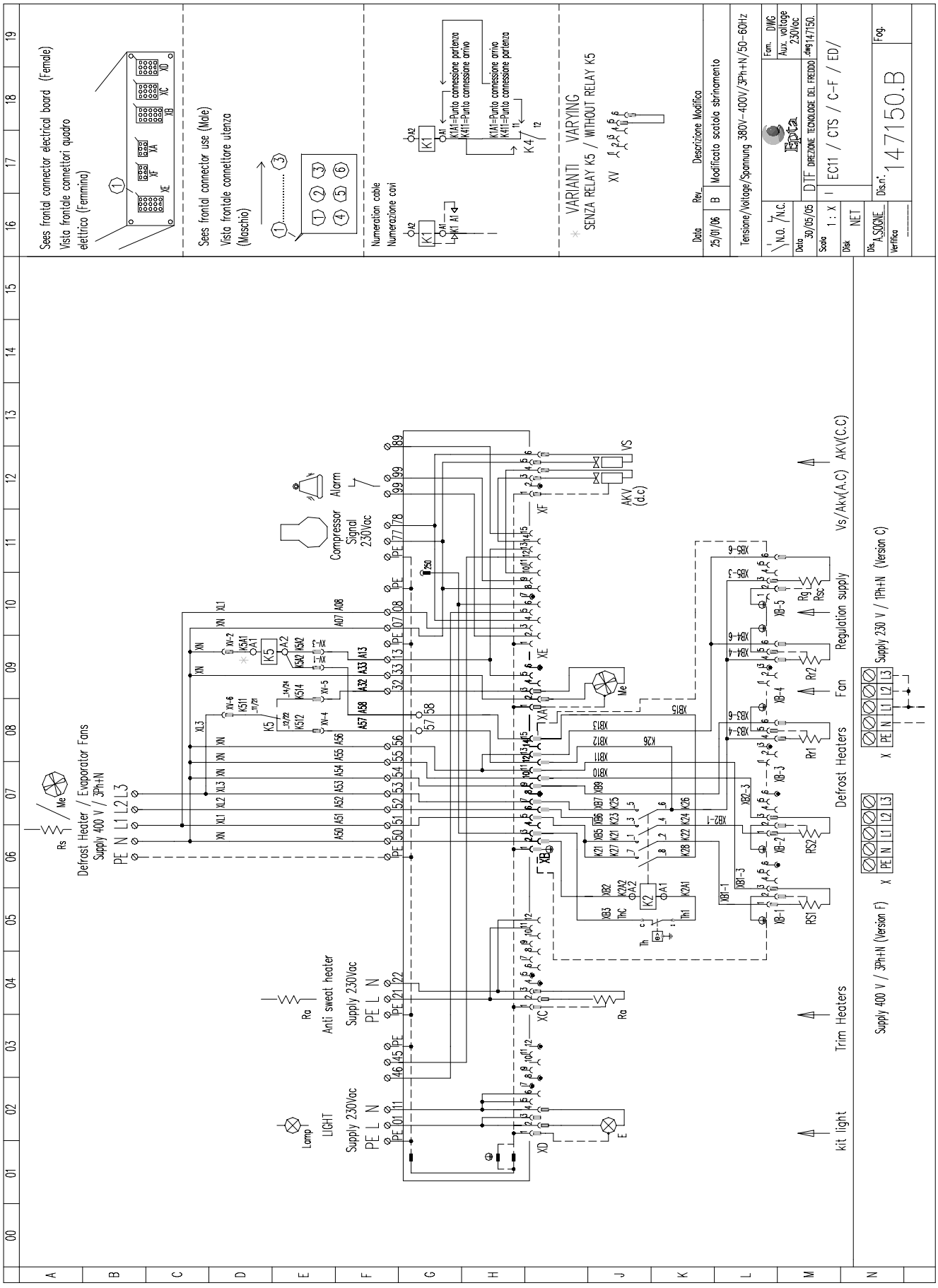

Sees frontal connector electrical board (Female)
Vista frontale connettori quadro elettrico (Femmina)
Sees frontal connector use (Male)
Vista frontale connettore utenza (Maschio)
Numeration cable
Numerazione cavi
K1=Punto connessione partenza
K1=Punto connessione arrivo
VARIANTI VARYING
*SENZA RELAY K5 / WITHOUT RELAY K5
Data 13/05/05 24/06/06
Rev B C
Descrizione Modifica
Aggiunto kit relay K5
Modificato scatola sbrinamenti
Tensione/Voltage/Spannung 380V~400V/3Ph+N/50~60Hz
Aux. voltage 230Vac
DTF DIREZIONE TECNOLOGIE DEL FREDDO
EC11 / SRTS 3 / F / ED/ S-ILL /
Dis.n°. 147133.C
Foglio
Scala 1 : X
Disk NET
Data 11/01/05
Dis. A.SIGONE
Verifica
SUPPLY VOLTAGE 380-400 Vac / 3Ph +N / 50-60Hz
kit light
Trim Heaters
Defrost Heaters
Fan
Regulation supply
Vs/Akv(A.C)
AKV(C.C)
AKV (d.c)
VS
Me
E
Ra
Rr1
Rr2
Rsc
Rg
RS1
RS2
Q1
Q2
Q3
K1
K2
K5
A
XD
XC
XA
XB
XE
XF
YAA

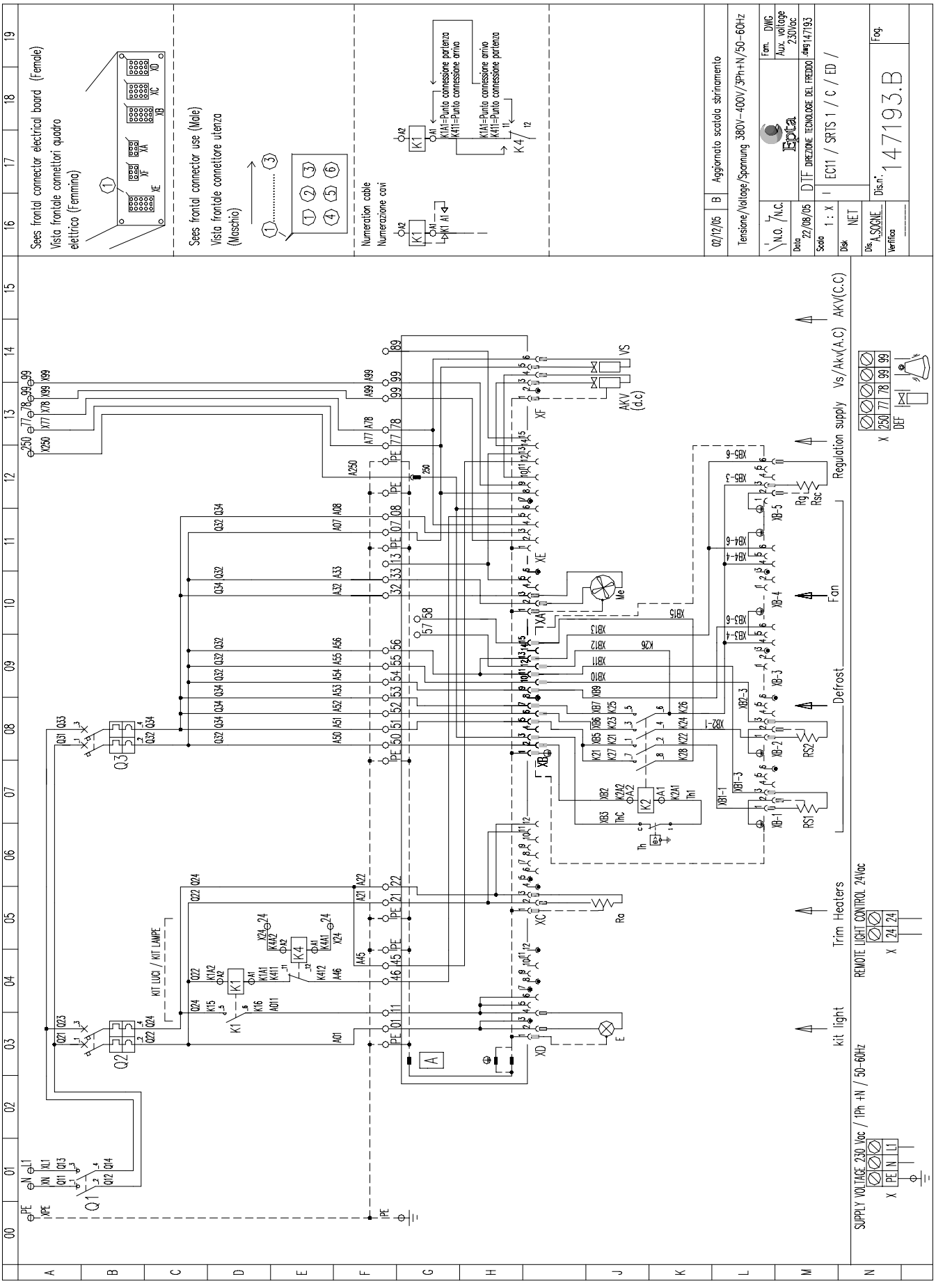

Sees frontal connector electrical board (Female)
Vista frontale connettori quadro elettrico (Femmina)
Sees frontal connector use (Male)
Vista frontale connettore utenza (Maschio)
Numeration cable
Numerazione cavi
K1A1-Punto connessione partenza
K1A1-Punto connessione arrivo
K1A1-Punto connessione arrivo
K1A1-Punto connessione partenza
VARIANTI VARYING
SENZA RELAY K5 / WITHOUT RELAY K5
Data Rev. Descrizione Modifica
13/05/05 B Aggiunto kit relay K5
25/01/06 C Modificato scatola sbrinamento
Tensione/Voltage/Spannung 380V-400V/3Ph+N/50-60Hz
Fam. DWC
Aux. voltage 230Vac
DTF DIREZIONE TECNOLOGIE DEL FREDDO dwg147134
Scala 1 : X
EC11 / FTB / F / ED /
Disk NET
Dis.n°: 147134.C
Fog.
Verifica
XM / XN / SRTS
kit light
Trim Heaters
Defrost Heaters
Fan
Regulation supply
Vs/Akv(A.C)
AKV(C.C)
VS
AKV (d.c.)
Me
Rq
Rsc
Rf2
Rf1
RS2
RS1
Ra
K5
K2
Th
DEF


Me = Ventole Evaporatore / Evaporator Fan
Vs = Valvola solenoide / Solenoid Valve
E = Luci / Lampe
Rsc = Resist.scarico/Drain heater
Rs = Resist.sbrinamento/Coil defrost heater
Rr = Resist.ripresa/Heater on air inlet
Rg = Resist.gocciolatoio/Drip-tray def.heater
Ra = Resist.antiappannante/Anti sweat heater
XD = Connettore alimentazione lampade / Connector Lamps
XC = Connettore resistenze antiappannanti / Connector anti sweat heater
XA = Connettore ventilatori evaporatore / Connector evaporator fans
XF = Connettore valvola solenoide / Connector solenoid valve
XB.= Connettore resistenze sbrinamento / Connector defrost heater
M.T WHALE 2000 / M.T LEOPARD
WHALE 2000 G
WHALE 2000 G 2EV
LEOPARD
WHALE 1000 G - WHALE 1500 G / NP
Tensione/Voltage/Spannung
N.O. / N.C.
Data 10/01/05
Scala 1 : X
Disk NET
Dis. A.SIGONE
Verifica
Espitia
DTF DIREZIONE TECNOLOGIE DEL FREDDO
SCHEMA COLLEGAMENTO UTENZE
EC11 / F
Dis.n°. 147135.A
Fog.
Form. DWG
Aux. voltage 230Vac
.dwg 147135.A

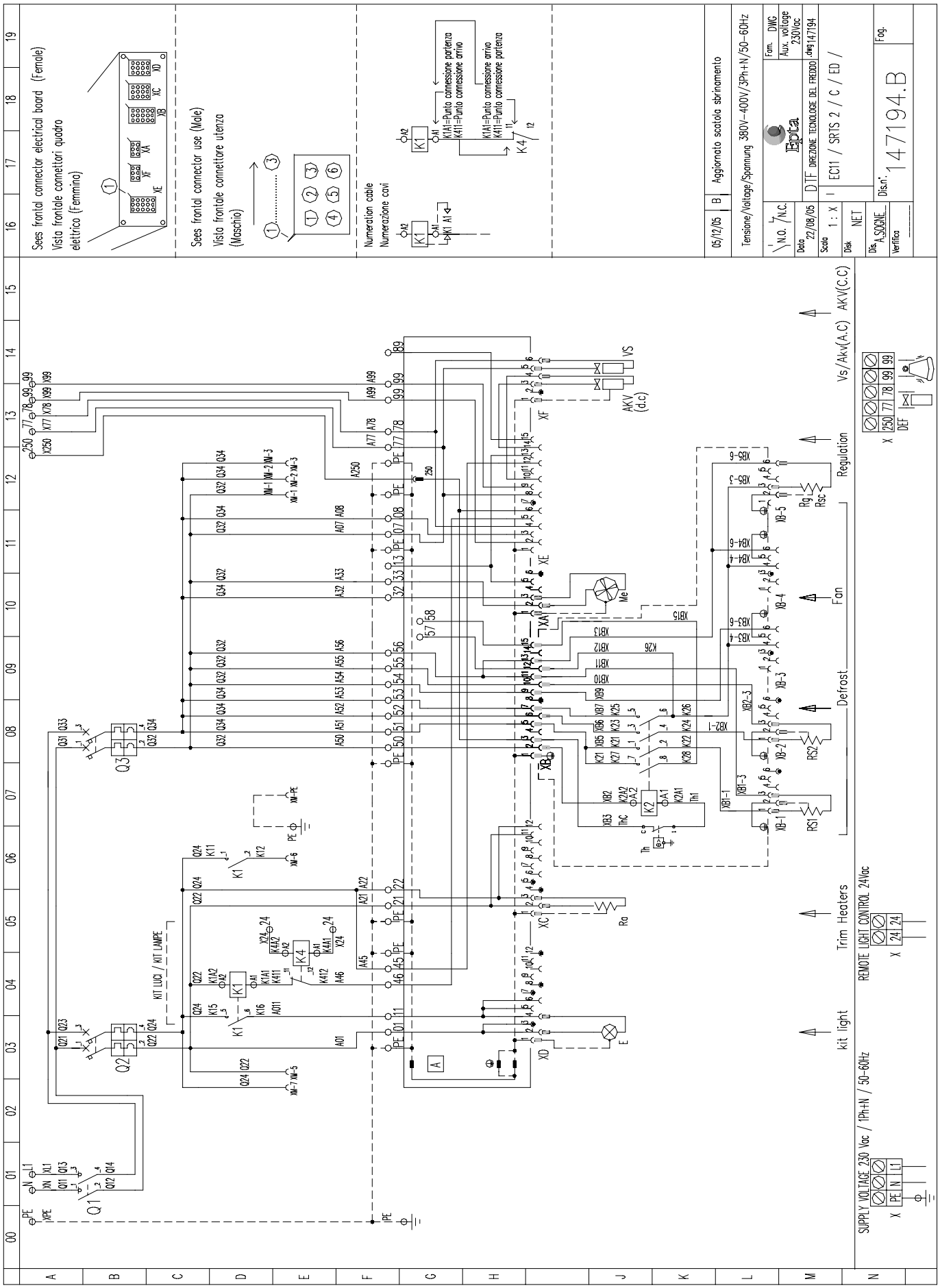

OPTIONAL
1)
TIMER
XP3
XP6
Timer
XP4
XP1
2)
Relay start defrost
XP4
XP1
A1
K
A2
Data 04/10/05
Rev. B
Descrizione Modifica
Variato modello timer inizio sbrinamento
(*) FINDER 12.01.230.0000 / ORBIS DUO
Tensione/Voltage/Spannung 230V / 50-60Hz
N.O. / N.C.
Data 11/01/05
Scala 1 : X
Disk. NET
Dis. A_SOGNE
Verifica
DTF DIREZIONE TECNOLOGIE DEL FREDDO
CONTROLLORI DI SERIE EC11/
EKC201C / SRTS-FTB
Fam. dwg
Aux. voltage 230Vac
dwg 147136
Dis.n.° 147136.B
Fog.
EKC201 PER TEMPORIZZAZIONE
Echelon
EKC201C
Tt
IN DEF OUT
DISPLAY
12V PWR DO DI C
F D C
COM
ALL
S3 S4 S5
230/12V-3VA 50/60Hz
OPTIONAL
Slave 1
Slave 2
XE
EKC201 PER SINCRONIZZAZIONE
RTC
Master / Salve
Slave / Slave


OPTIONAL
1)
TIMER
2)
Relay start defrost
Data 04/10/05
Rev. B
Descrizione Modifica
Variato modello timer inizio sbrinamento
(*) FINDER 12.01.230.0000 / ORBIS DUO
Tensione/Voltage/Spannung 230V / 50-60Hz
Scala 1 : X
Disk NET
Dis. A.SOGNE
Verifica
DTF DIREZIONE TECNOLOGIE DEL FREDDO
CONTROLLORI DI SERIE EC11/
EKC414_A / SRTS-FTB
Dis.n.: 147137.B
Fog.
Fam. dwg
Aux. voltage 230Vac
dwg147136
EKC414_A PER TEMPORIZZAZIONE
Max 10 EKC
AKS..R
EKA..
EKC 414_A
Supply 230V
230Vac
OPTIONAL
Slave 1
Slave 2
EKC414_A PER SINCRONIZZAZIONE (RTC)
RTC
RS485
MASTER SLAVE


Sees frontal connector electrical board (Female)
Vista frontale connettori quadro elettrico (Femmina)
Sees frontal connector use (Male)
Vista frontale connettore utenza (Maschio)
Numeration cable
Numerazione cavi
K11=Punto connessione partenza
K11=Punto connessione arrivo
K11=Punto connessione arrivo
K11=Punto connessione partenza
VARIANTI VARYING
SENZA RELAY K5 / WITHOUT RELAY K5
Data 25/01/06
Rev. B
Descrizione Modifica
Modificato scatola sbrinamento
Tensione/Voltage/Spannung 380V~400V/3Ph+N/50~60Hz
N.O. N.C.
Data 30/05/05
Scala 1 : X
Disk NET
Dis. A.SOGNE
Verifica
DTF DIREZIONE TECNOLOGIE DEL FREDDO
EC11 / CTS / C-F / ED/
Dis.n°: 147150.B
Fog.
Fam. DMC
Aux. voltage 230Vac
dms147150.
Defrost Heater / Evaporator Fans
Supply 400 V / 3Ph+N
PE N L1 L2 L3
Rs
Me
Compressor Signal 230Vac
Alarm
VS
AKV (d.c)
Vs/AKv(A.C)
AKV(C.C)
Defrost Heaters Fan
Regulation supply
Rr1
Rr2
Rsc
Rq
RS1
RS2
Anti sweat heater
Supply 230Vac
Ra
Trim Heaters
Supply 400 V / 3Ph+N (Version F)
Supply 230 V / 1Ph+N (Version C)
LIGHT
Supply 230Vac
Lamp
kit light
K1
K2
K5
K4
K21
K22
K23
K24
K25
K26
K27
K28
Th
Th1


Sees frontal connector electrical board (Female)
Vista frontale connettori quadro elettrico (Femmina)
Sees frontal connector use (Male)
Vista frontale connettore utenza (Maschio)
Numeration cable
Numerazione cavi
K1A1=Punta connessione partenza
K411=Punta connessione arrivo
02/12/05 B Aggiornato scatola sbrinamento
Tensione/Voltage/Spannung 380V~400V/3Ph+N/50~60Hz
Tam. DWG
Aux. voltage 230Vac
DTF DIREZIONE TECNOLOGIE DEL FREDDO
Data 22/08/05
Scala 1 : X
Disk NET
Dis. A.SOONE
Verifica
Dis.n.° 147193.B
Fog.
EC11 / SRTS 1 / C / ED /
SUPPLY VOLTAGE 230 Vac / 1Ph +N / 50-60Hz
REMOTE LIGHT CONTROL 24Vac
kit light
Trim Heaters
Defrost
Fan
Regulation supply Vs/Akv(A.C) AKV(C.C)
AKV (d.c)
VS
Me
E
Ra
Rg
Rsc
RS1
RS2
Th
Thc
KIT LUCI / KIT LAMPE

COSTAN TECHNICAL DOCUMENTATION	CHAPTER REVISION STATUS				CONFORMS TO APPROVED ORIGINAL	PAGE: **1/13**
CABINET: **LEOPARD**	ORD.	DATE	ORD.	DATE		
CHAP. No.. **9** DOC No. **QSM000259E**	A	**20.02.06**	D			DATE OF 1ª ISSUE: **30.September.05**
CHAPTER: **WIRING DIAGRAMS**	B		E			
	C		F			



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CABINET: **LEOPARD**	ORD.	DATE	ORD.	DATE		
CHAP. No.. **9** DOC No. **QSM000259E**	A	**20.02.06**	D			DATE OF 1ª ISSUE: **30.September.05**
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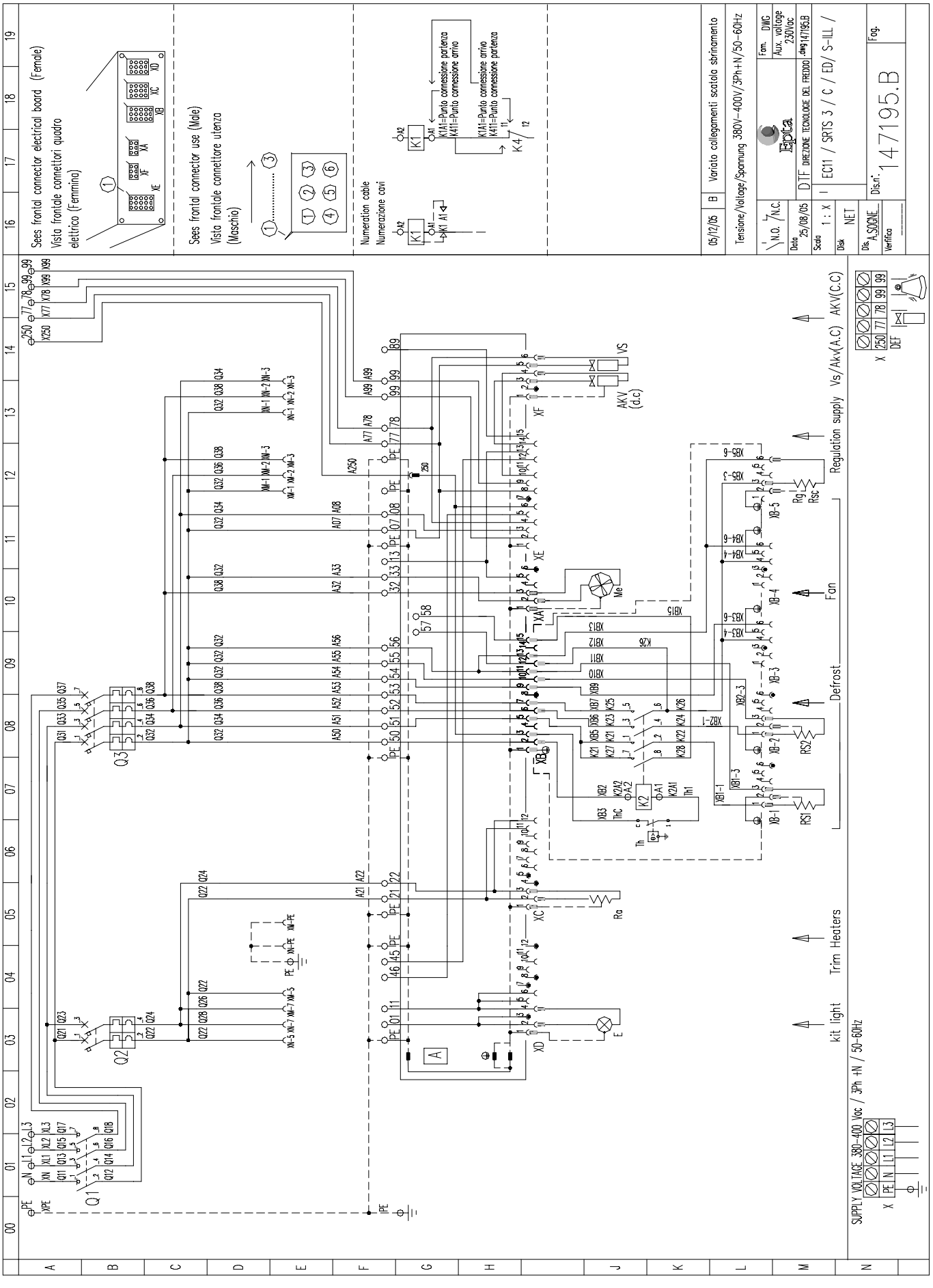
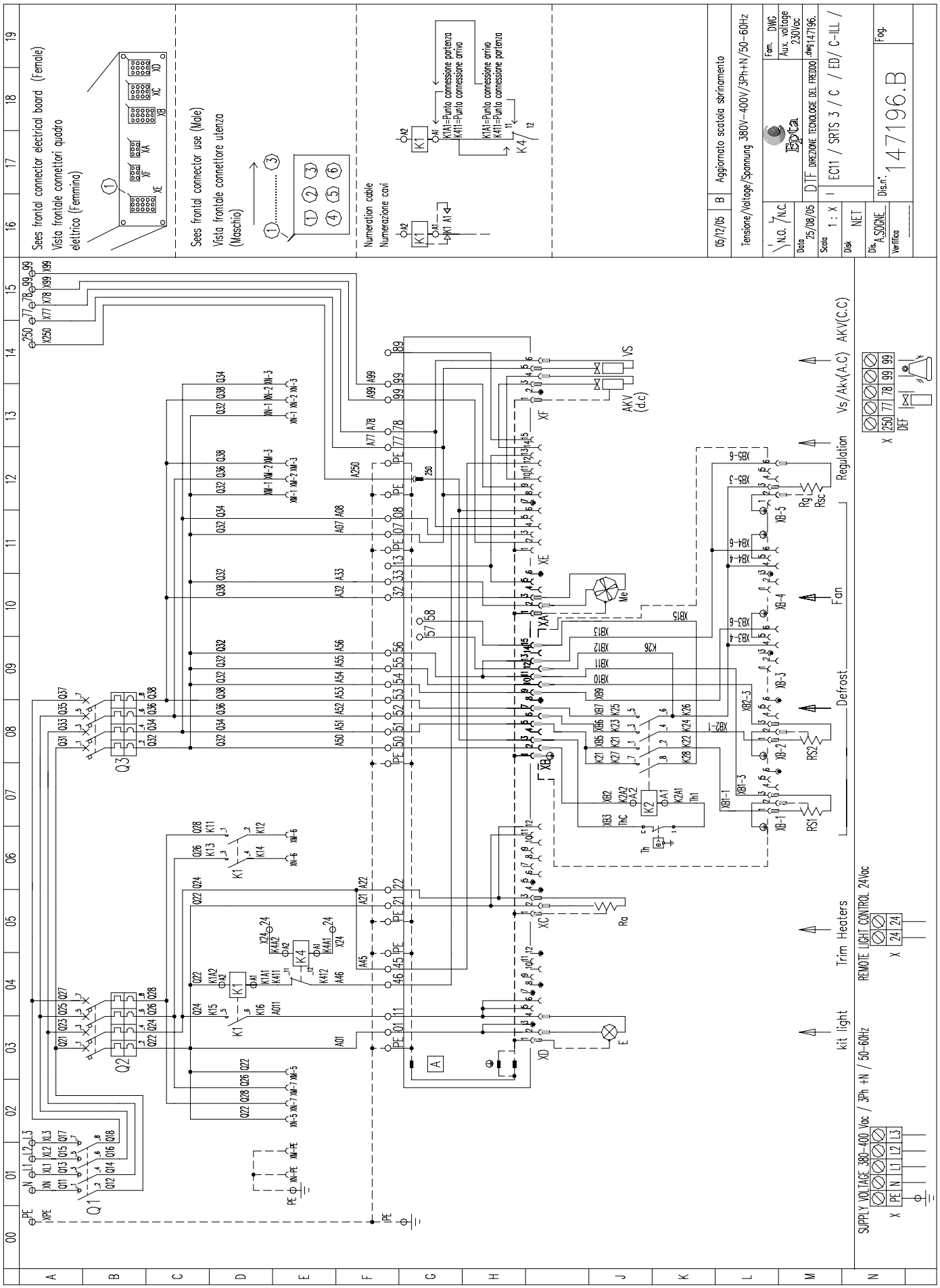


COSTAN TECHNICAL DOCUMENTATION	CHAPTER REVISION STATUS				CONFORMS TO APPROVED ORIGINAL	PAGE: **1/13**
	ORD.	DATE	ORD.	DATE		
CABINET: **LEOPARD**	A	**20.02.06**	D			
CHAP. No.. **9** DOC No. **QSM000259E**	B		E			DATE OF 1ª ISSUE: **30.September.05**
CHAPTER: **WIRING DIAGRAMS**	C		F			



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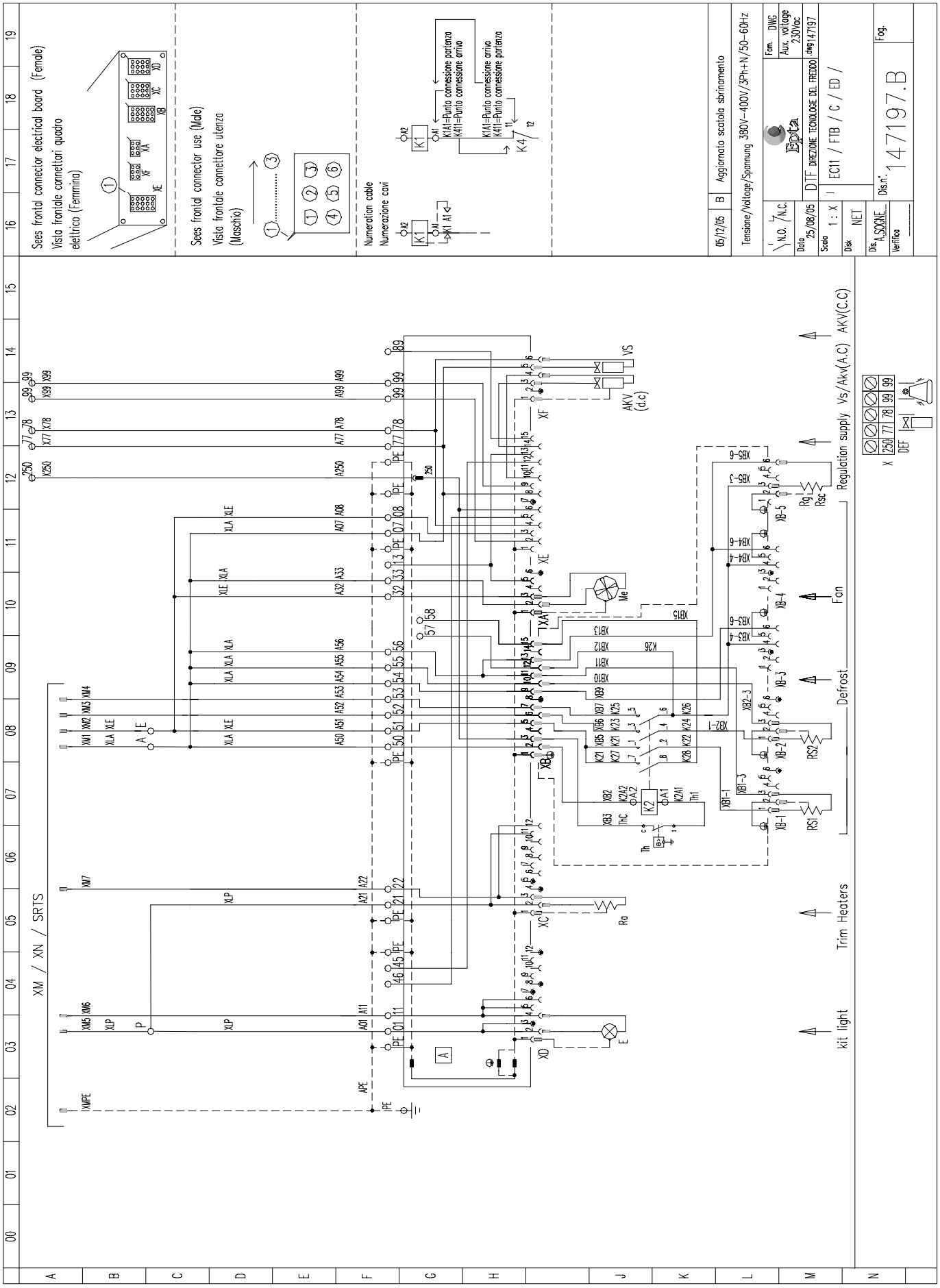
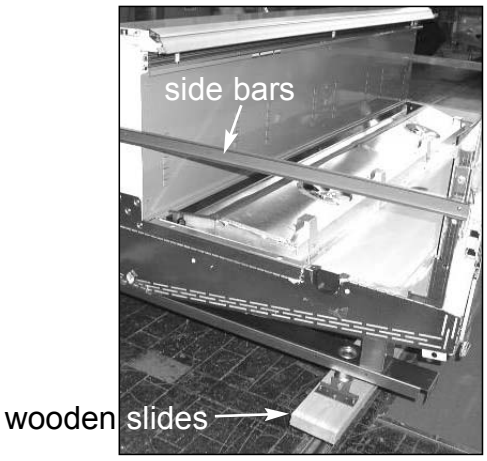
CABINET: **LEOPARD**	ORD.	DATE	ORD.	DATE		DATE OF 1ª ISSUE: **30.September.05**
CHAP. No.. **9** DOC No. **QSM000259E**	A	**20.02.06**	D			
CHAPTER: **WIRING DIAGRAMS**	B		E			
	C		F			

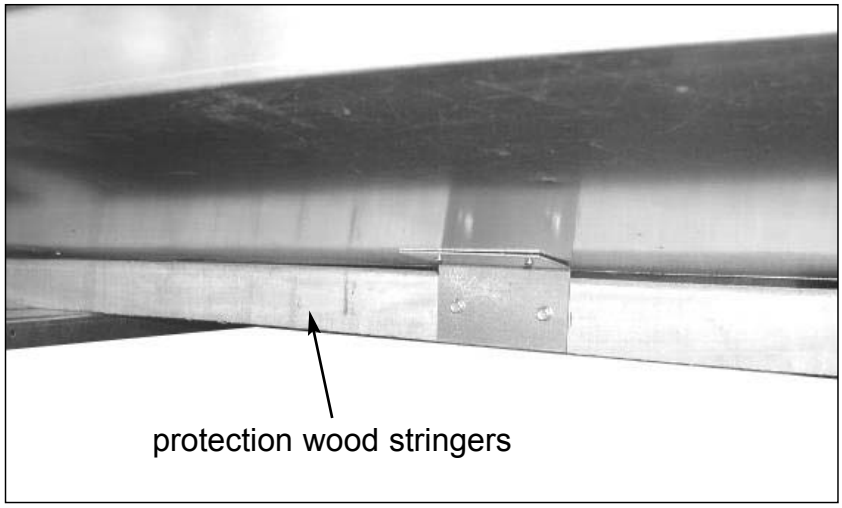


MULTIPLEXING CABINETS

UNPACK THE CABINETS

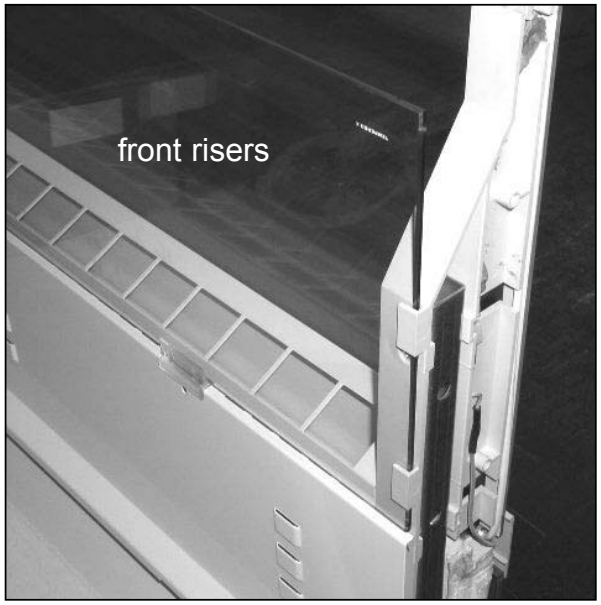
Remove the wooden slides and side bars that are meant to protect the cabinet during transportation. Remove the wood stringers located under the cabinet, which are meant to protect this during transportation (see photo).
Unpack the cabinets with the utmost care to avoid scratching or denting.

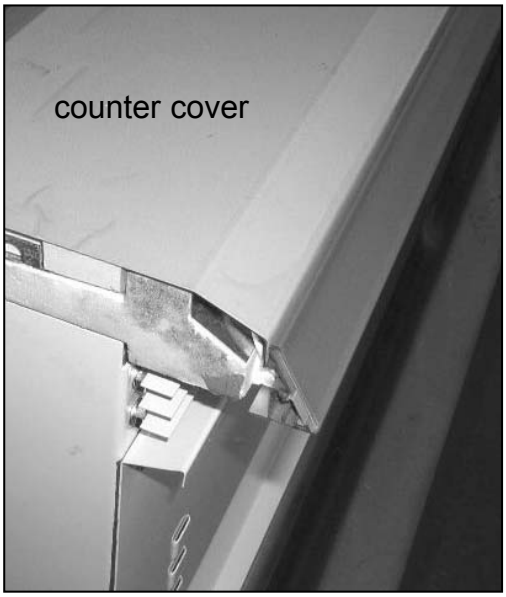




REMOVE FRONT RISERS, BOTTOM PLATES AND COUNTER COVER

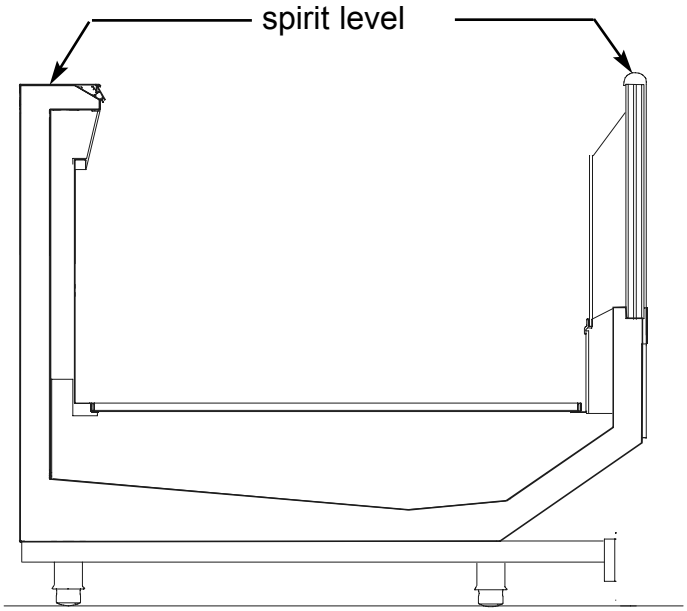
Remove front risers from the cabinet multiplexing side. Remove the bottom plates.
Lift the counter cover off and remove it from the multiplexing side.





PLACE THE FIRST CABINET

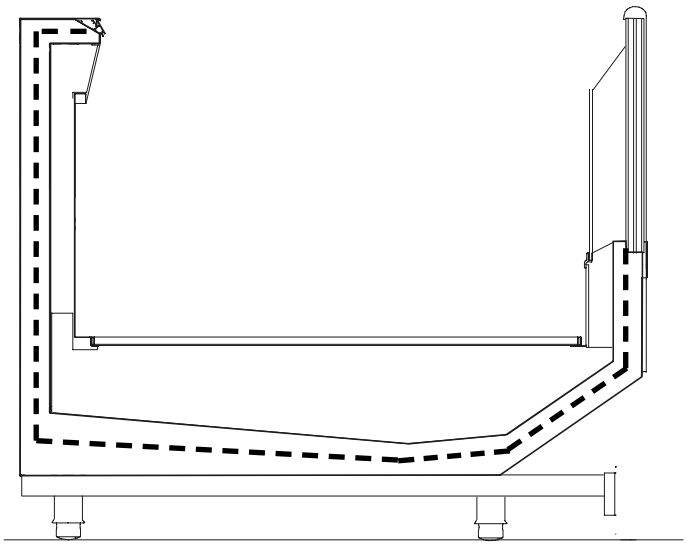
Bring the cabinet wherever this is to be installed. **When mutiplexing includes an end cabinet, position the end cabinet first**. **Check that it is level** both crossways and lengthwise by the use of a spirit level. Level the cabinet by applying a cylinder-section tool on the feet (Ø = 8 mm).
CAUTION: do not fully unscrew the feet of the cabinet. The cabinet is delivered, the feet are NOT IN THEIR FINAL POSITION; the height of the cabinet is bigger then design height. This is why, when installing, it is necessary to alter the height of feet in order for the upper edge of the handrail to be 910mm high



APPLY SPONGE RUBBER AND SILICONE

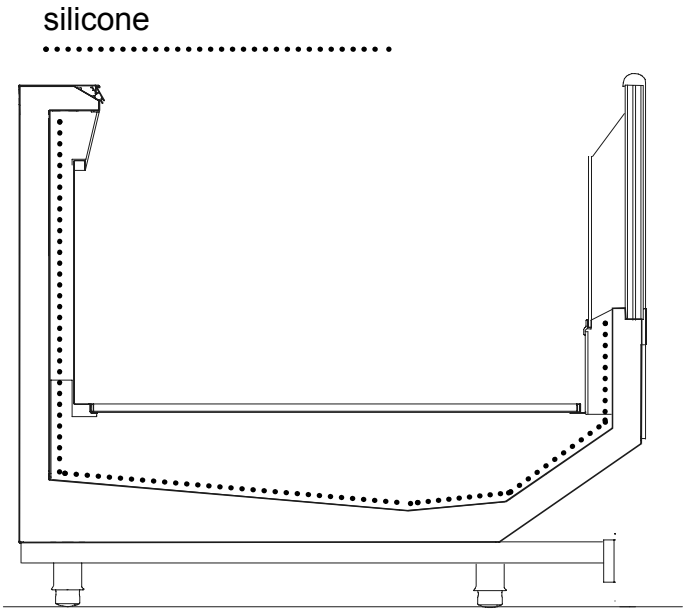
Apply sponge rubber and a smooth seam of silicone onto the side of one of the cabinets to be multiplexed following the instructions in the figure.

sponge rubber



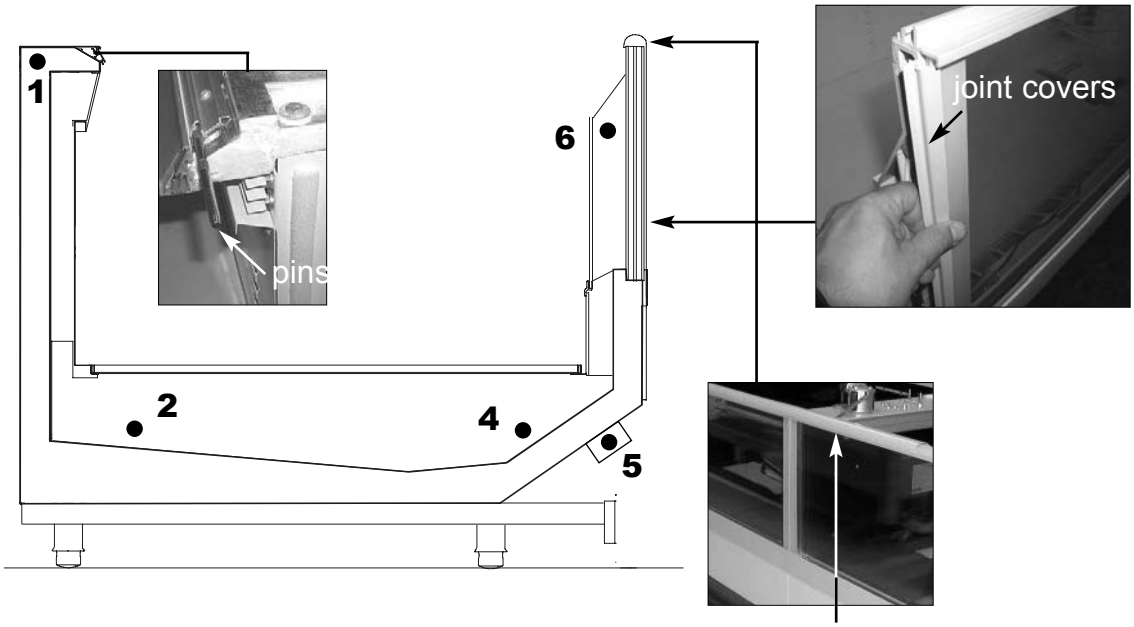
CAULK THE SIDE WITH SILICONE

Apply a smooth seam of silicone as shown in the photo.



BRING THE CABINETS TOGETHER AND JOIN THEM

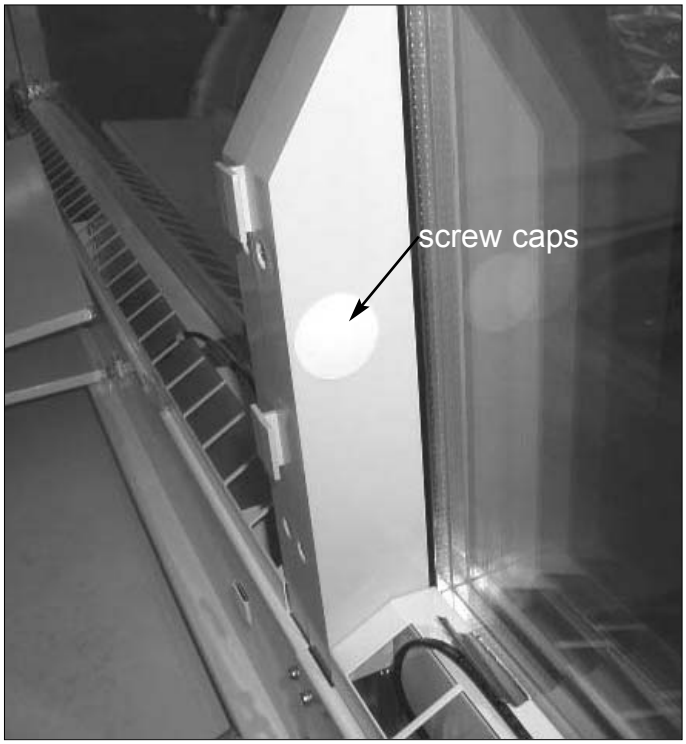
Before bringing the cabinets near each other **place the front glazing joint cover and two pins for the counter alignment** onto one of the cabinets to be multiplexed. Bring the cabinets near each other and check their levelness. Then join them following the sequence below: A) points 2-4 by hex-head screws M8x90; B) point 5 by hex-head screws M8x35 and the respective nuts; C) point 1 by a bolt HM6x30; D) point 6 by hex-head screws M8x35 and the respective nuts.



For best alignment between the glazing of straight cabinets and end cabinets, use the embedded plastic "all-purpose" handrail pieces when multiplexing the cabinets. Place them on their respective supports when it comes to aligning the glazings. Once the cabinets have been multiplexed, remove the "all-purpose" handrail-piece, which will later be used for the assembly of handrails, as explained further on in this document.

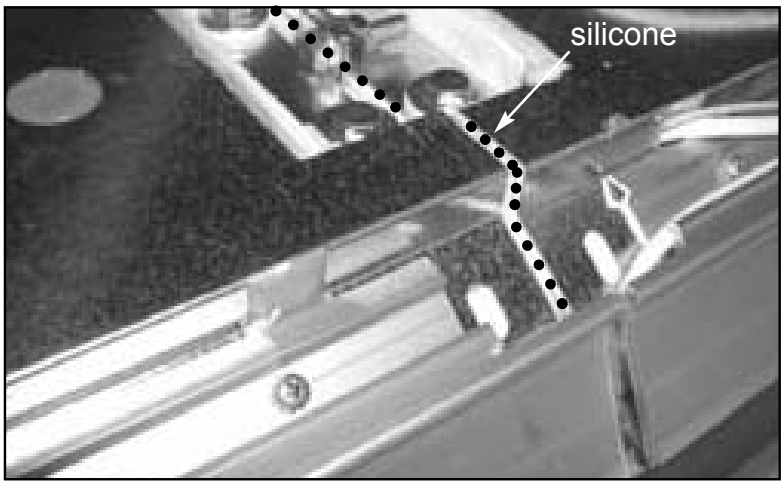
PLACE SCREW CAPS

When the cabinets have been joined, place screw caps on the linear cabinets, in points 1 and 10.

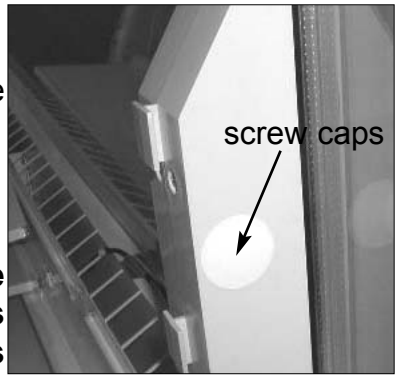


CAULK THE JOINT BETWEEN THE COUNTERS WITH SILICONE

Apply a smooth seam of silicone in the joint between the counters.
Put the counter covers back in place and fix them with silicone.



PLACE SCREW CAPS



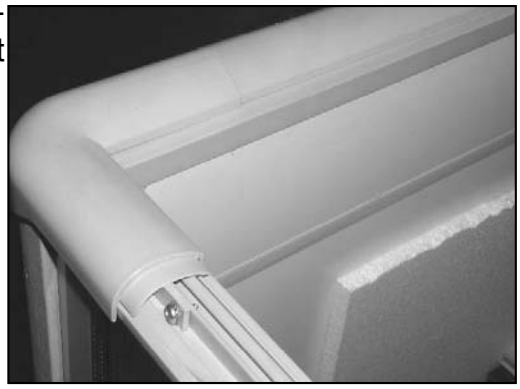
Once the cabinets have been multiplexed, place the screw caps on the screws on the well front.

INSTALL HANDRAILS

Side handrails and corner pieces are factory-assembled. **The side handrails of end cabinets are mounted on the cabinet instead. This is why it is necessary to remove them prior to executing the steps described below for the "all purpose" handrail piece.**

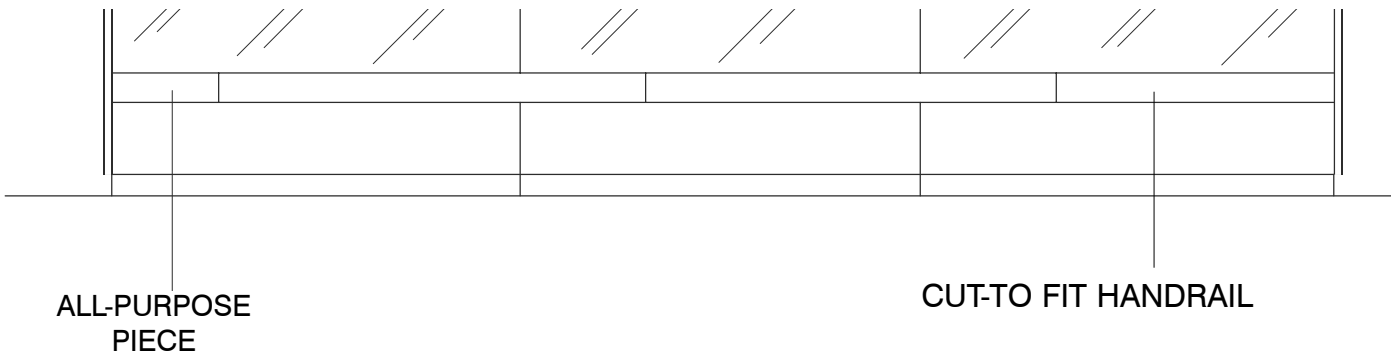
To enable a perfect alignment of the handrails on the front of multiplexed cabinets, some pieces of the effective cabinet length (1880, 2500 or 3750 mm) plus an all-purpose piece are attached.

Before being mounted, the handrails need to be properly cooled inside the base deck of the cabinet for some time. Then place the all-purpose handrail flush to one of the corner pieces on the profiles, and then all the others but the last likewise. Determine the remaining length, cut the last handrail to fit and install it on the profile.



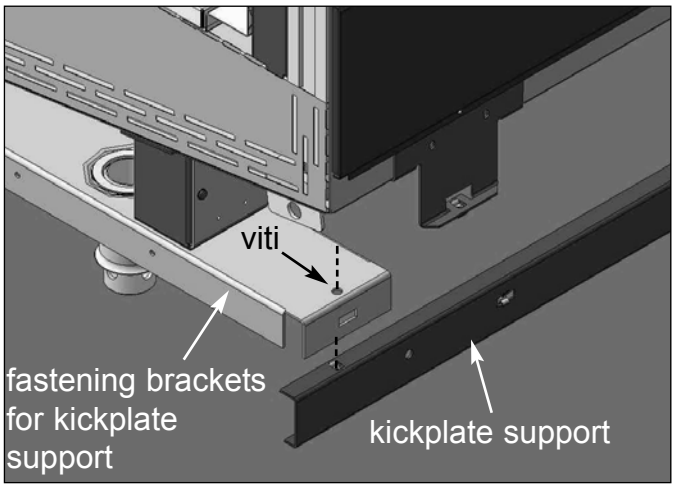
PLACE THE INTEGRAL BUMPER RAIL

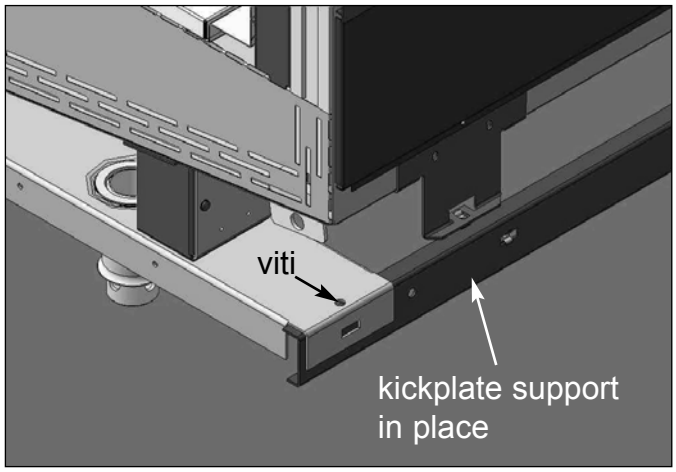
To enable a perfect alignment of the plastic bumper rails integral with the cabinet, an extra "all-purpose" piece, which is to be used to bring bumper rails back or forward. Mount the all-purpose handrail flush to one of the endwalls on the supports, and then all the others but the last likewise. Determine the remaining length, trim the last bumper rail to fit and secure it to the support.



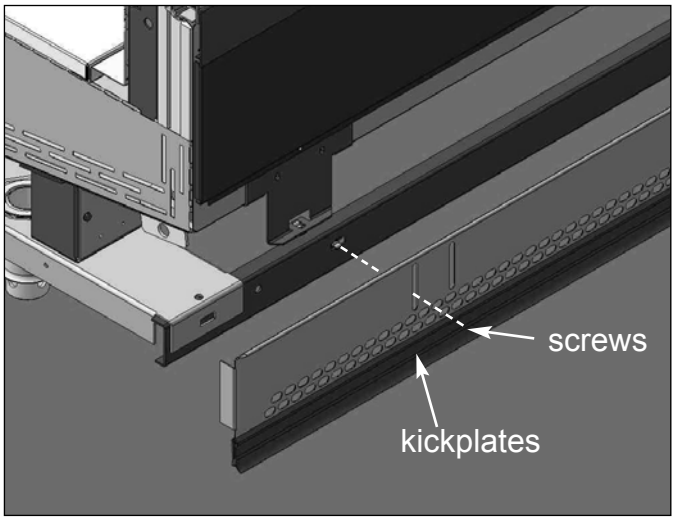
PLACE THE BASE PANEL AND THE KICKPLATES

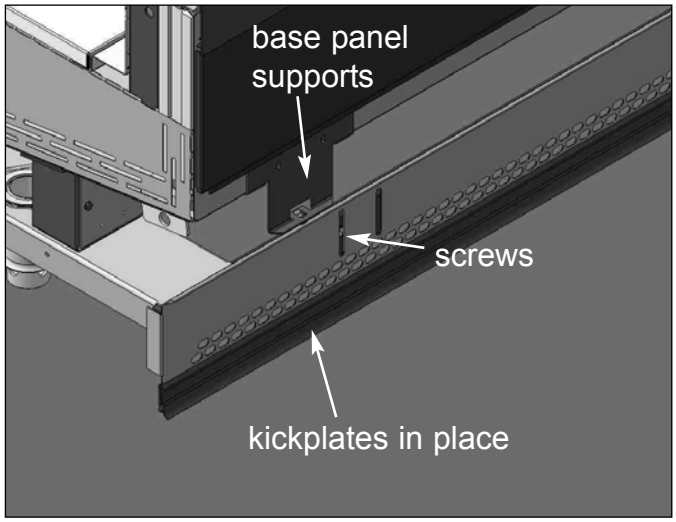
Place the kickplate support and screw it onto the appropriate supports using the screws attached, as shown in the figure.



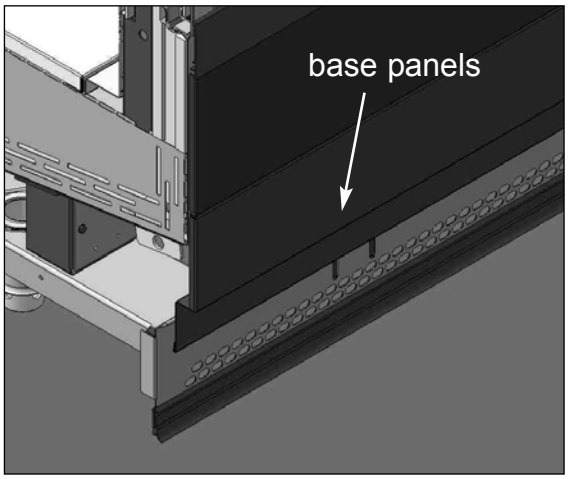


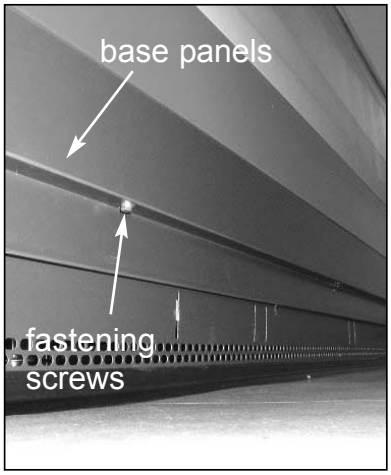
Place the kickplates onto the just installed supports by the screws supplied, as shown in the figures.



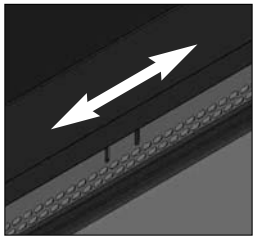


Lastly, install and fasten the base panels to their supports on the cabinet using the screws attached.





IMPORTANT: the base panels of MT (head cabinet) feature slots to be used when adjusting the position of panels horizontaly.

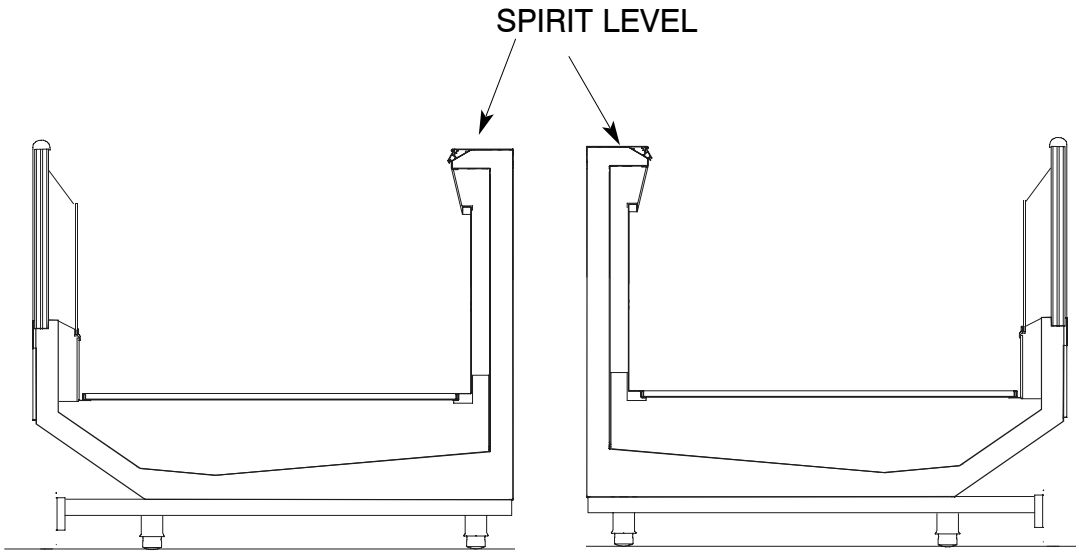


JOINING BACK-TO-BACK CABINETS WITH HEAD CABINETS

Follow all the steps in the previous section. The instructions for back-to-back multiplexing are provided here below. **When mutiplexing includes an end cabinet, position the end**

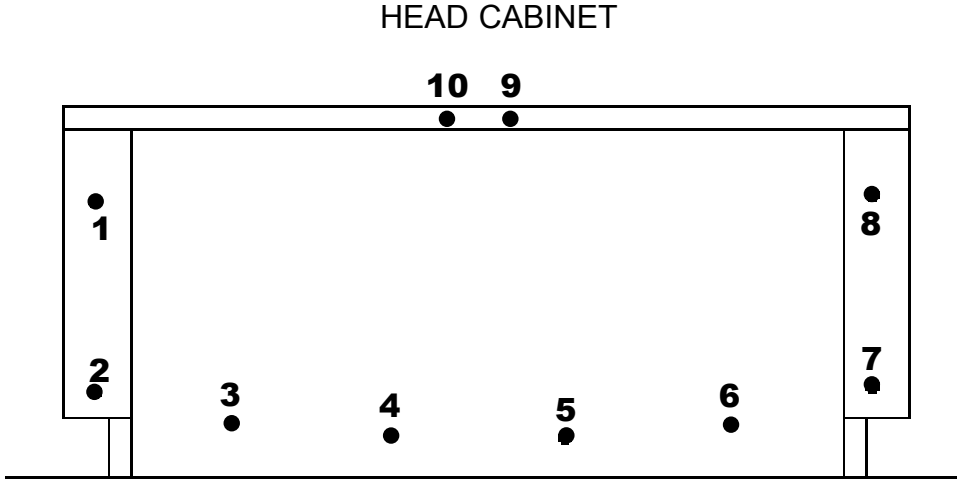
POSITION LINEAR CABINETS

Apply sponge rubber and silicone as explained in the previous section. Then bring linear cabinets back to back in their service position.
Check levelness by resting a spirit level on the counter. If needed, correct cabinet levelness using the adjustable feet.



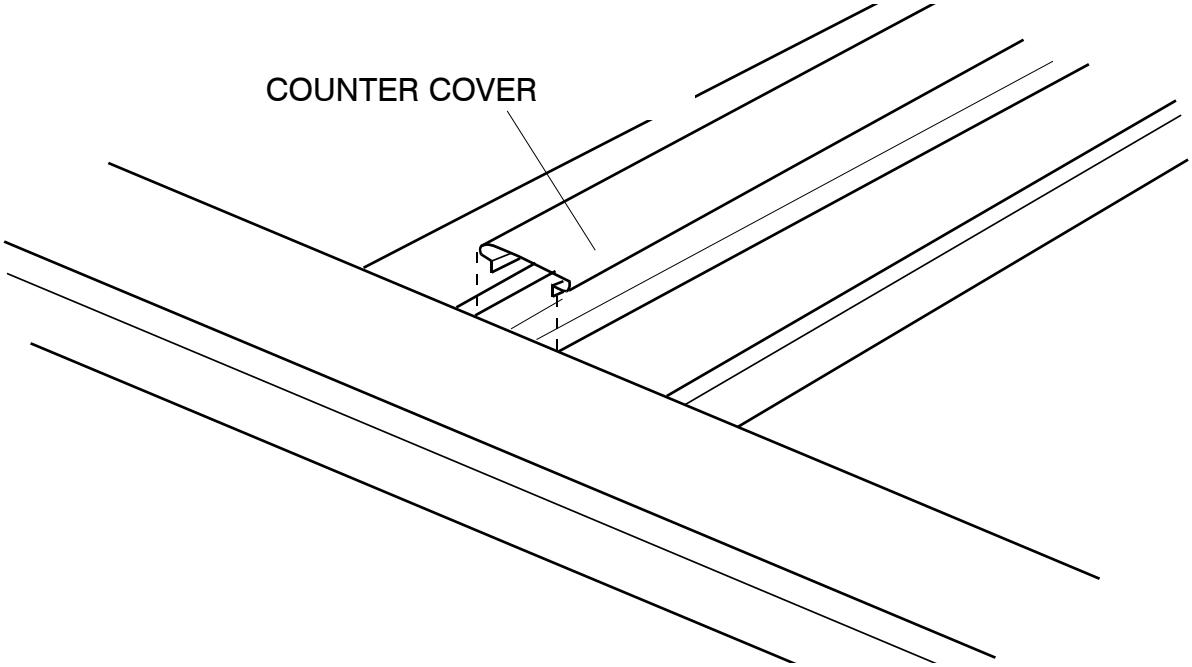
JOINING A LINEAR CABINET TO A HEAD CABINET

Bring the cabinets near each other and check their levelness. Then join them the points indicated in the figure using hex-head screws M8x90 and the appropriate nuts, and a self-screw on the points 9.10.



INSTALL COUNTER CENTRE COVERS

Place the counter centre covers on the back-to-back cabinets and fix them with silicone.

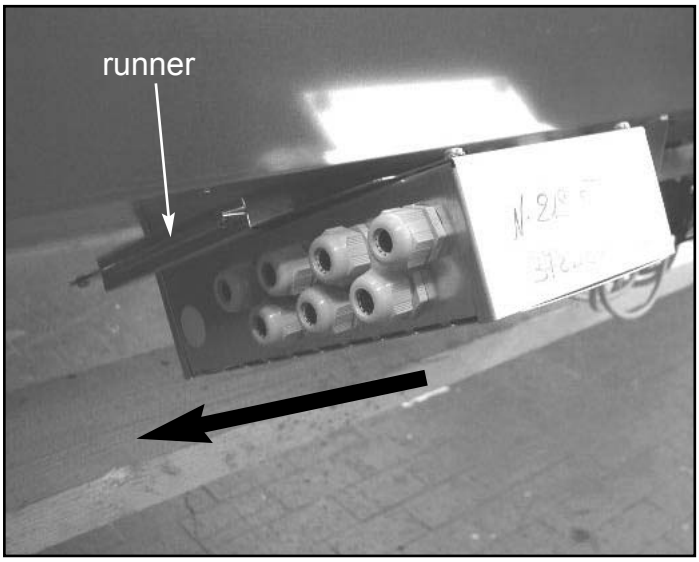


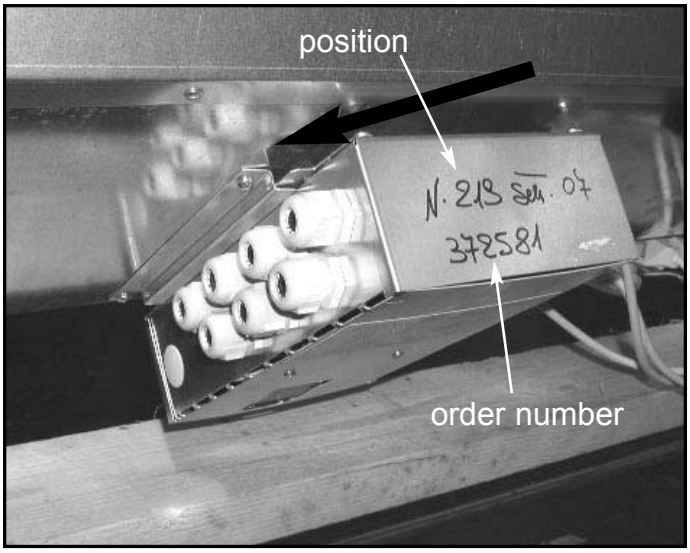
INSTALLATION OF ELECTRIC BOARD

The electrical board of many models is supplied separately in order to avoid damage during transportation. It is therefore necessary to install it on site.

How to identify the electrical board correctly: Electrical boards are marked with the order number and position. Using the production label attached to the cabinet it is possible to track down the electrical board of every cabinet with no margin for errors.

Place the electrical board in the respective runners under the cabinet, on the side opposite the drain.

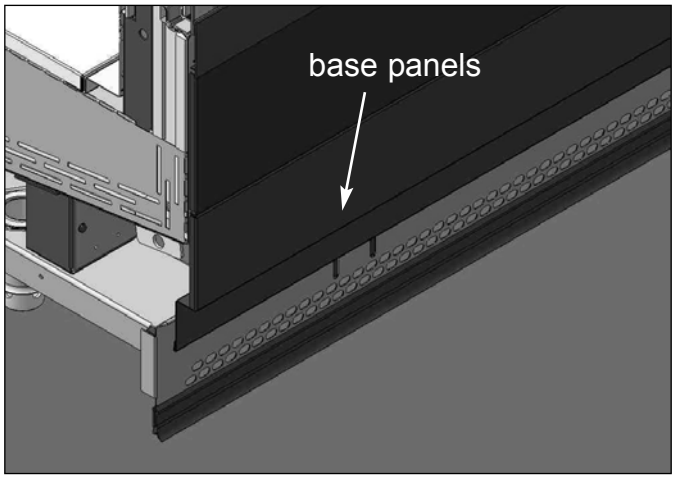


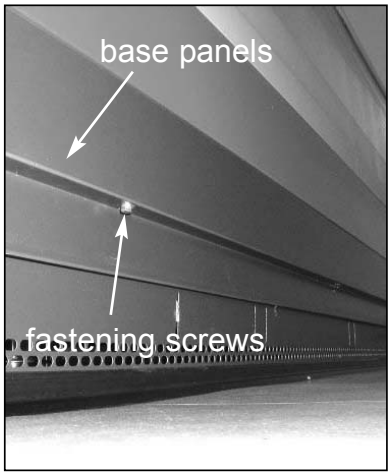


EXTRACTION OF ELECTRIC BOARD

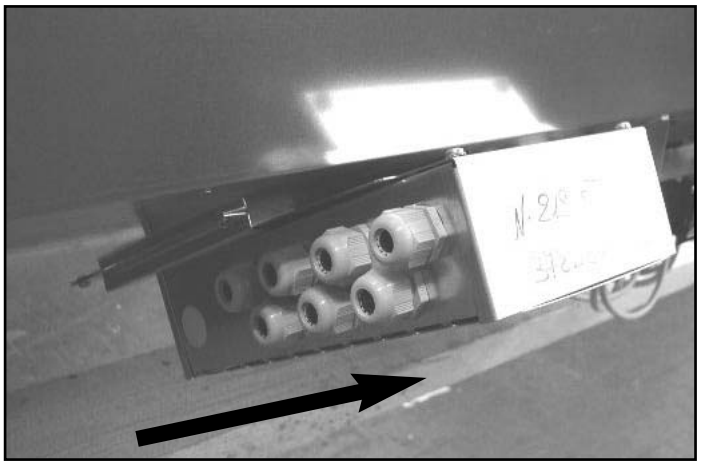
When it is necessary to perform jobs on the electrical board, proceed as explained below.

Unscrew and remove the base panel.





Pull the electrical board off the runner.



INSTALLATION OF PLEXIGLAS DIVIDERS

Dividers are necessary to keep ventilation separate on BT cabinets when defrosting processes are not in synch.

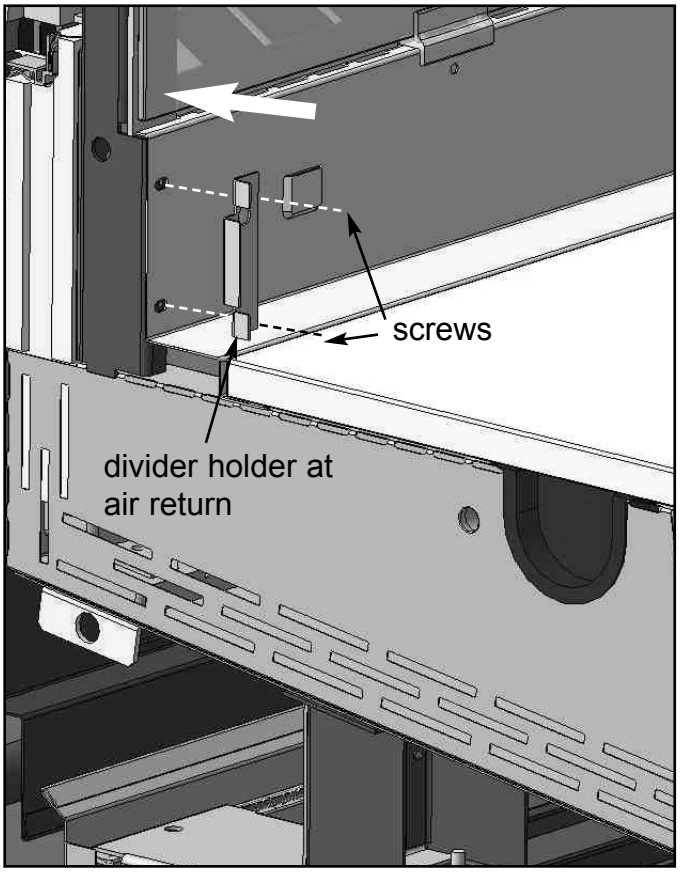
The dividers will be entered following the rules below:
MASTER1/MASTER-SLAVE/TERMINAL-BOARD
1 TECHNICAL RUN = q.ty 0
2 TECHNICAL RUNS = q.ty 1
3 TECHNICAL RUNS = q.ty 3 etc.

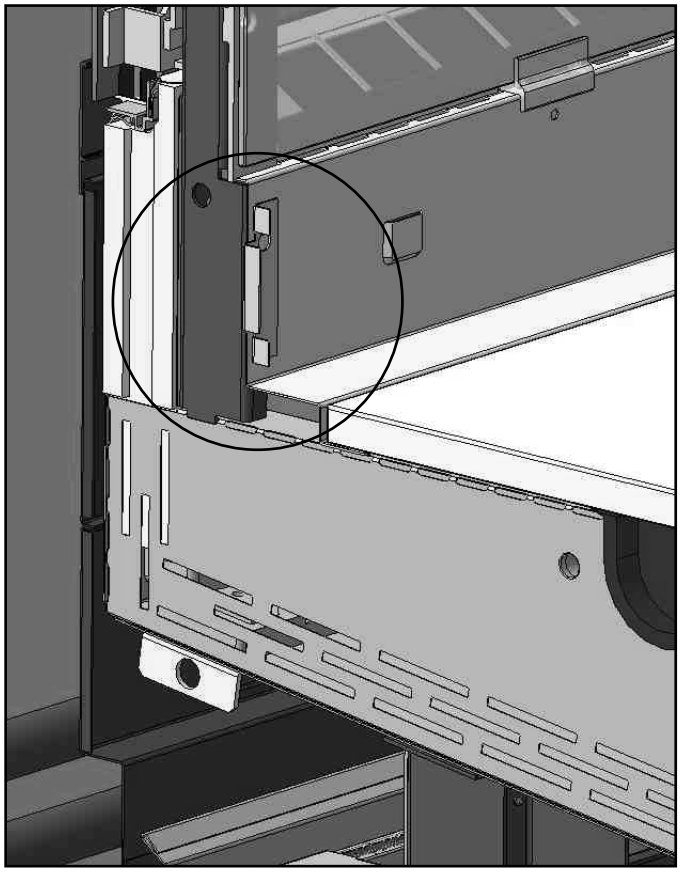
We wish to remind you that technical runs can be made up as follows

MASTER 1	1 CABINET
MASTER/SLAVE	1-2-3 CABINETS
TERMINAL BOARD	1-2-3 CABINETS
MASTER 2 (2EV)	1 or 2 CABINETS

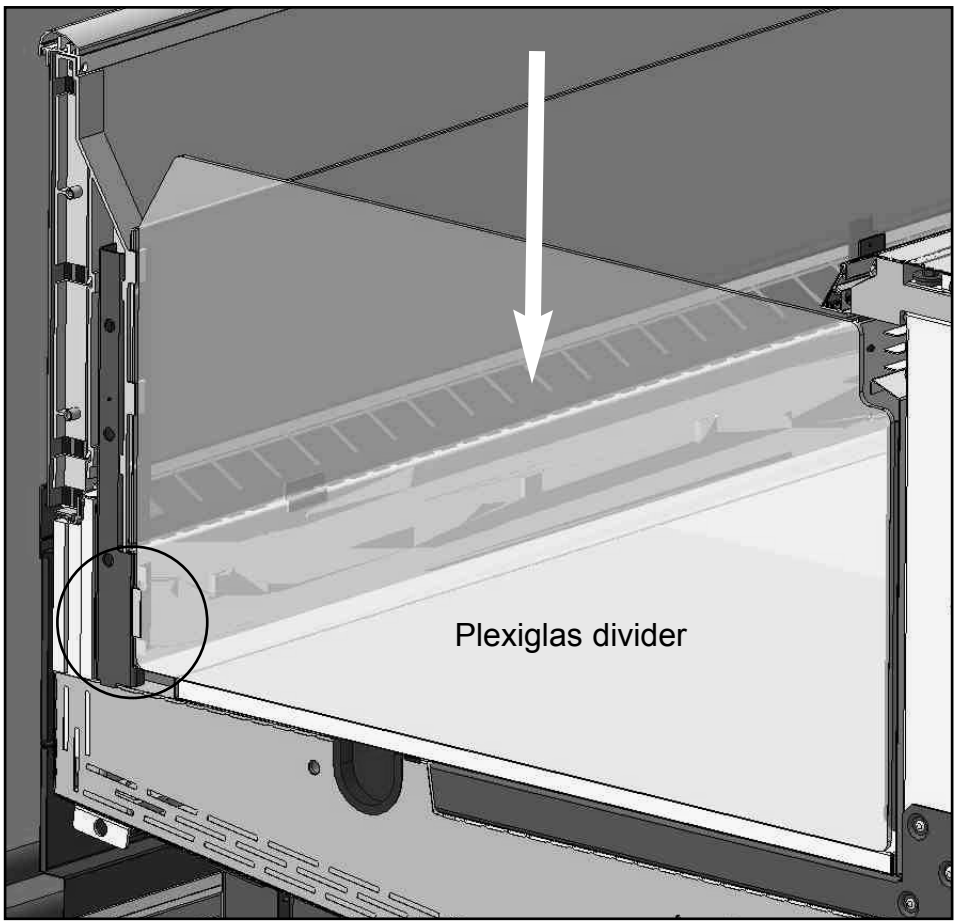
Technical Plexiglas dividers are not required between straight cabinets and head cabinets.

Place divider holders in the air return area as shown in the figures.

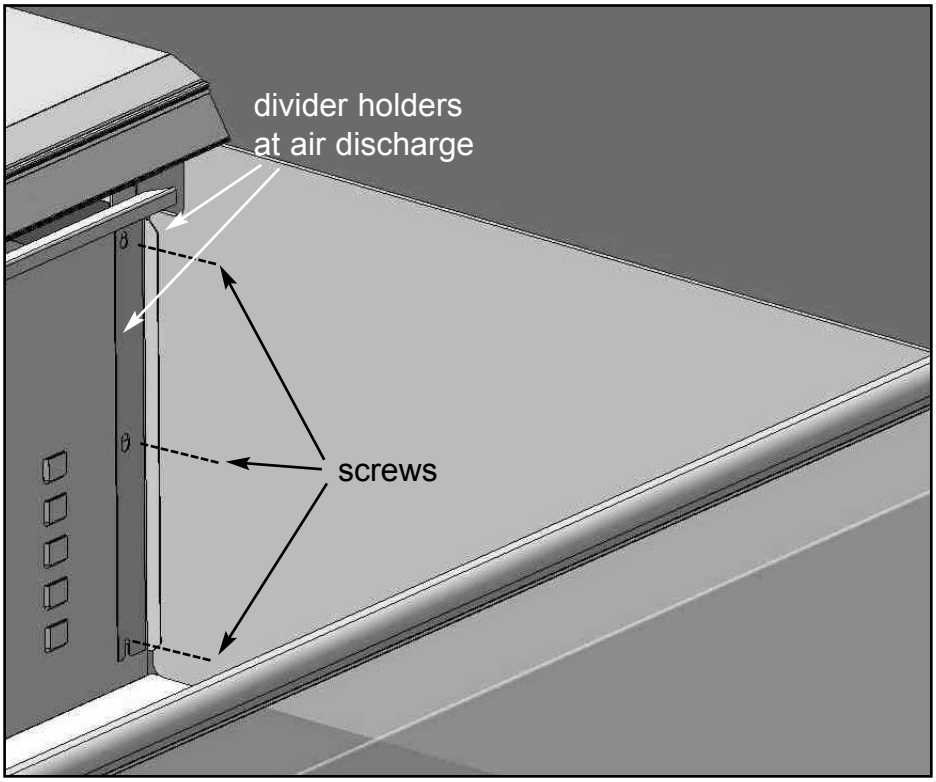




Slide Plexiglas dividers into the just-installed holders.



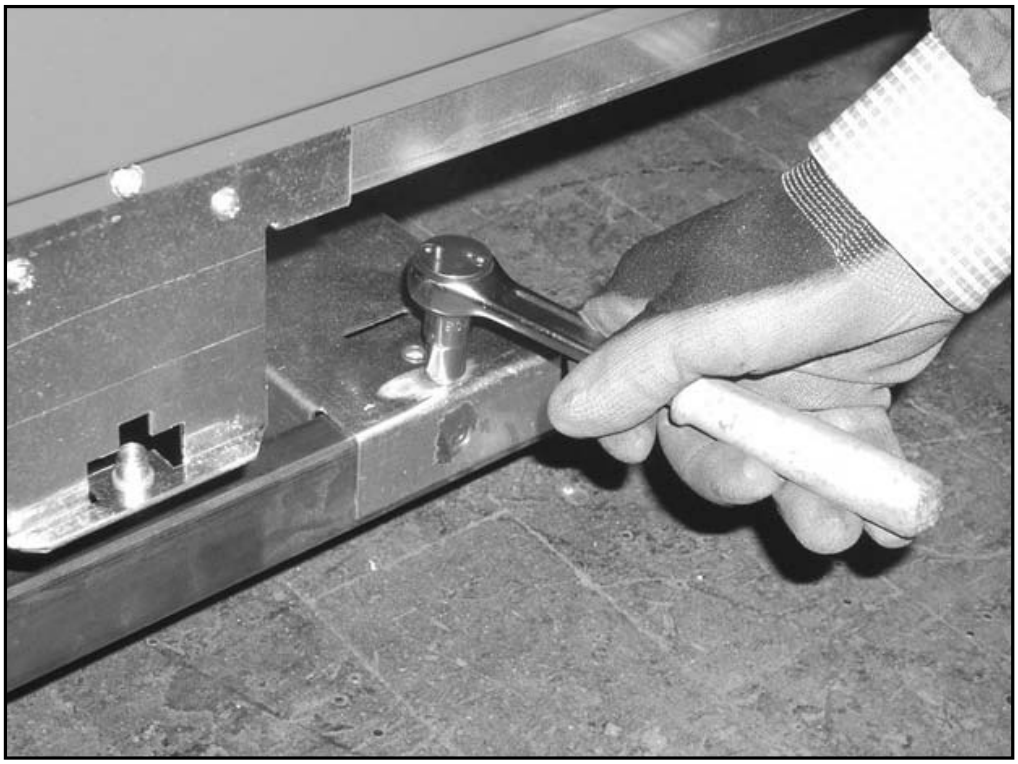
To complete divider installation, fasten them in the air-discharge area using the appropriate holders. **These must be placed on both sides of the divider.**



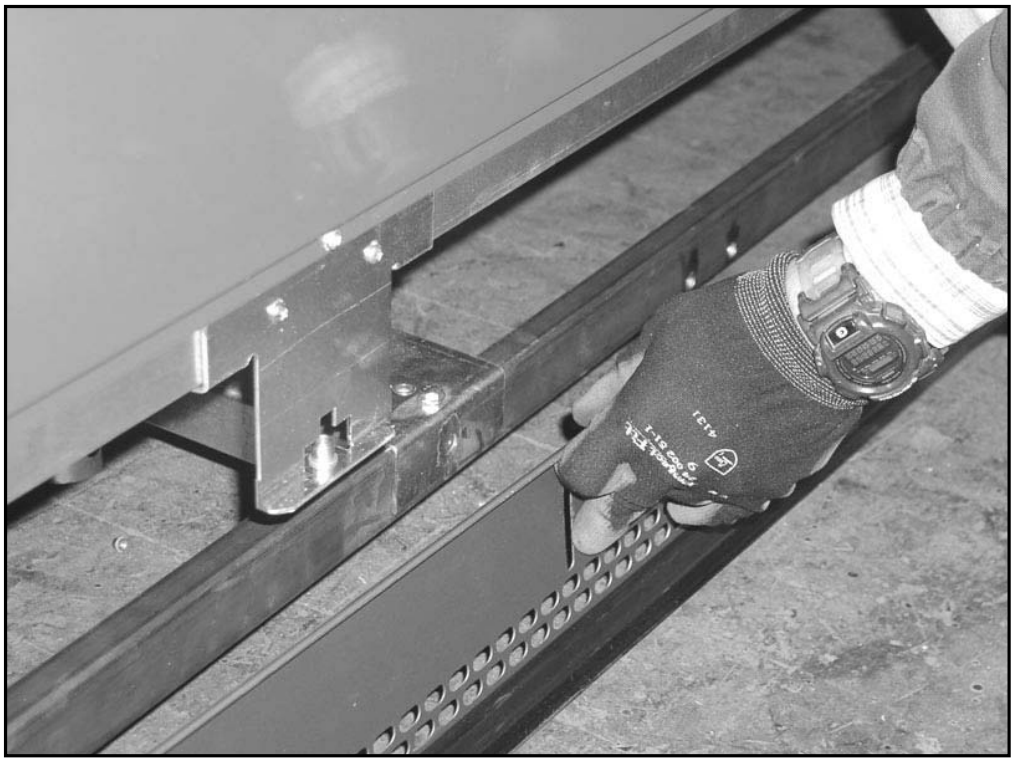
ASSEMBLY OF OPTIONAL STAINLESS-STEEL BUMPER RAIL

Place the stringer in the holding stirrups.

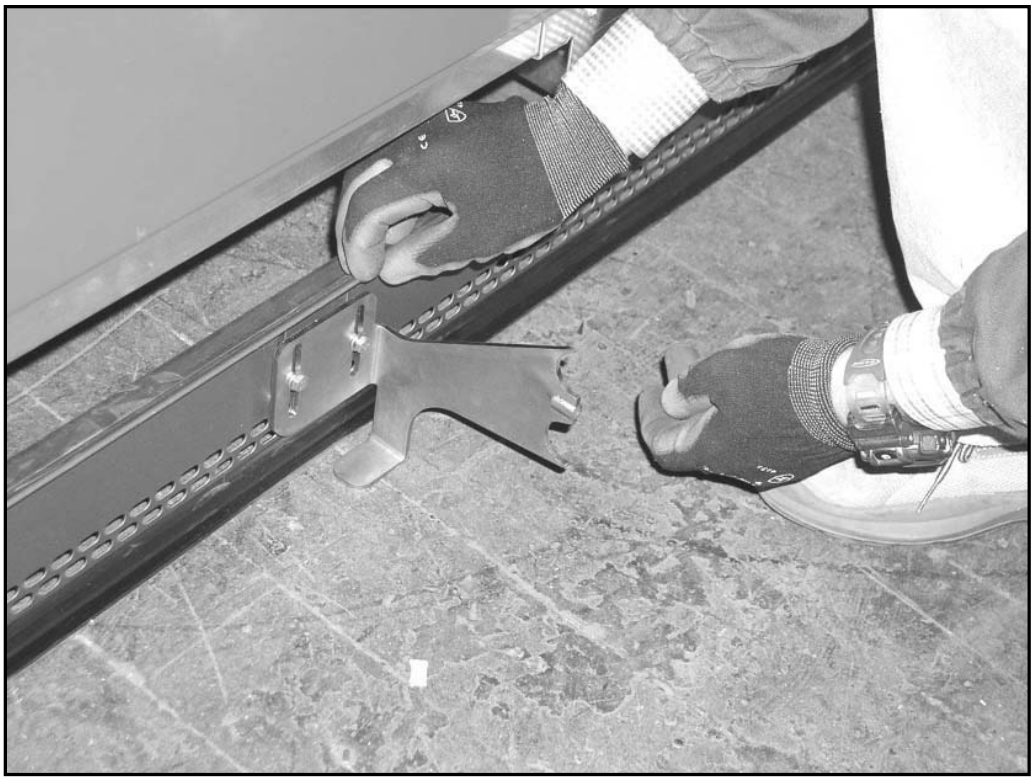
Fasten the stringers to the stirrups using the attached hex-head screws M6X30+washers.



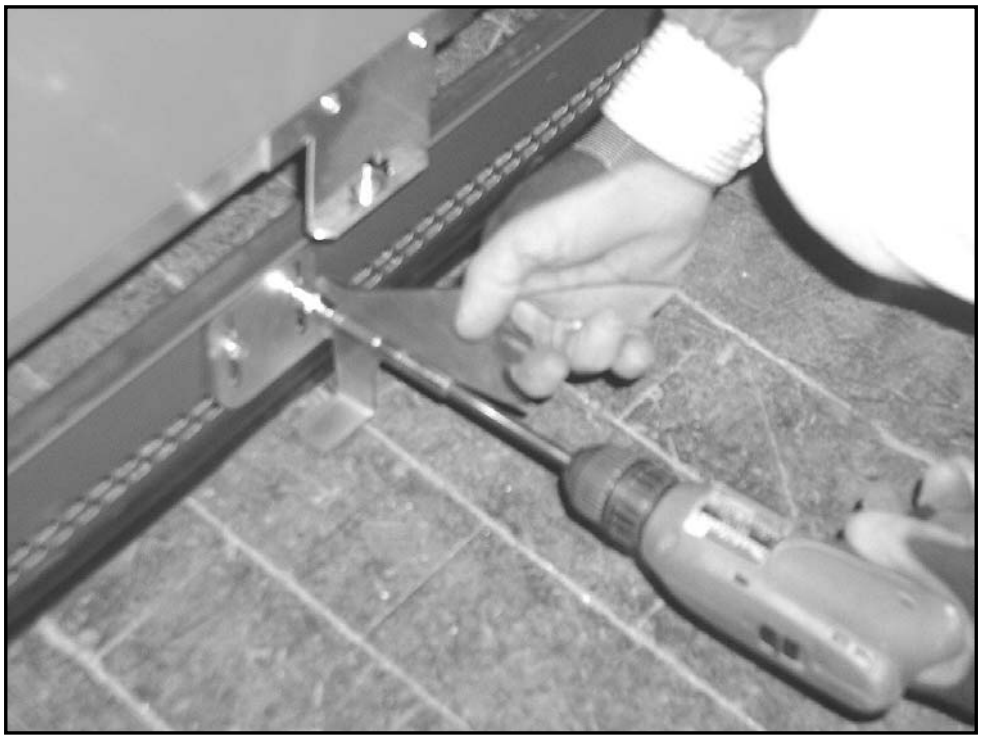
Lean the kick plates onto the just assembled stringers.



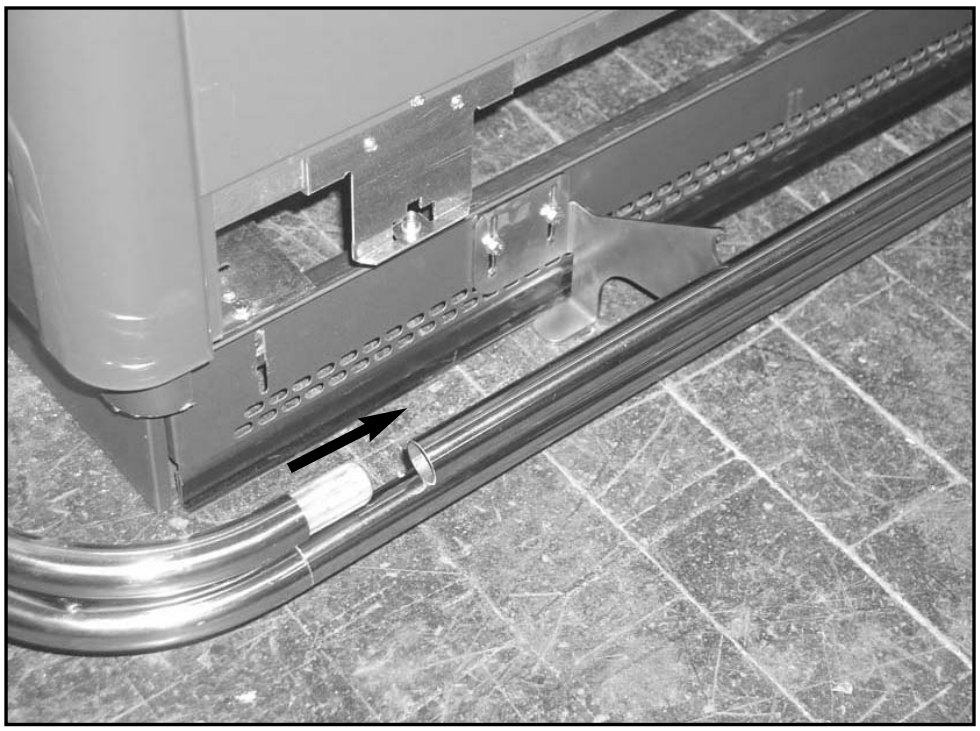
Place the bumper rail supports using the slots on the stringer and the slots on the bumper rail.



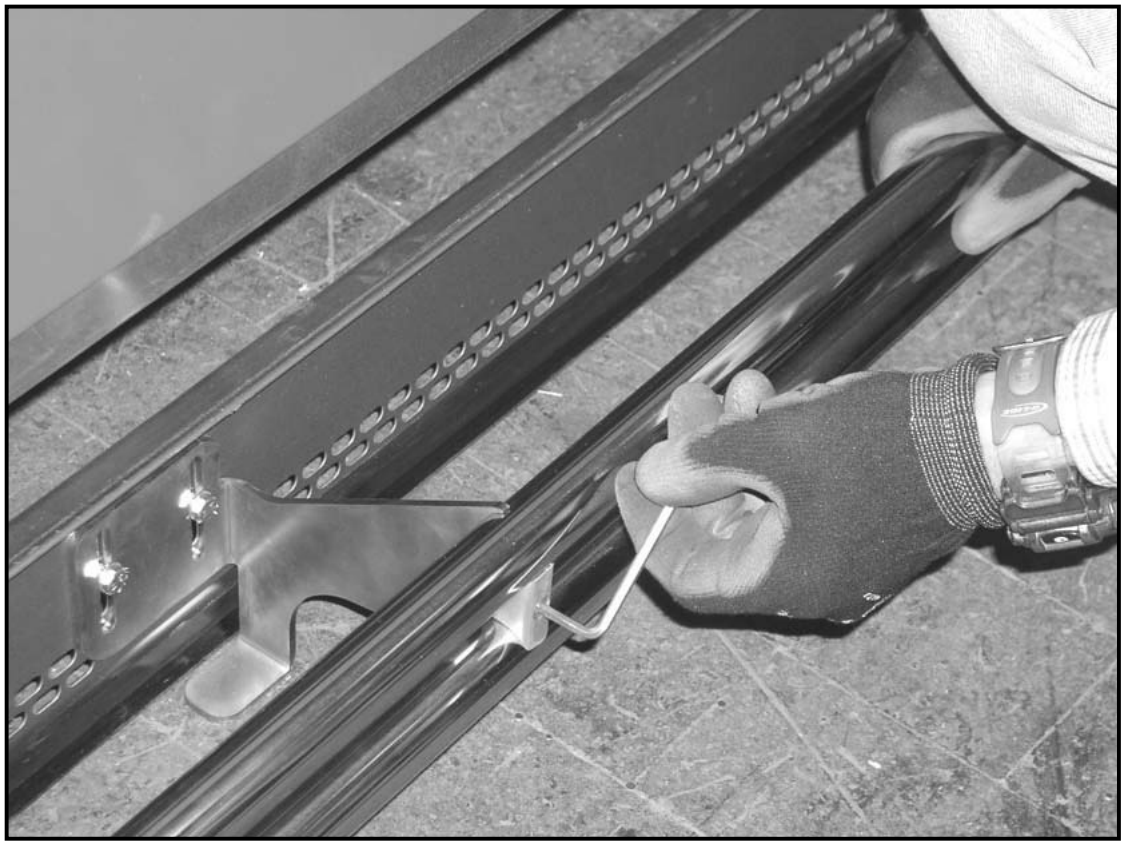
Fasten the bumper-rail supports using the appropriate hex-head M6x15+washers supplied; **ensure that the tip of the support is in direct contact with the floor.**



Place tubular stainless-steel bumper rails on their supports and the bumper rails with bends using the appropriate plastic joints.



Place and fasten the attached tubular bumper rail stop blocks using the Allen screw.



Lastly, mount bottom panels on their supports and secure them from below with hex-head screws M4x15.

ASSEMBLY OF OPTIONAL NIGHT BLINDS

- Drill the counter cover (1) with a Ø 2,5 drill bit with reference to the holes on the support (2).
- Fasten the supports (4) to the counter cover using self-tapping screws (3).
- Place the blind (5) on its support and fasten with self-tapping screws (6).