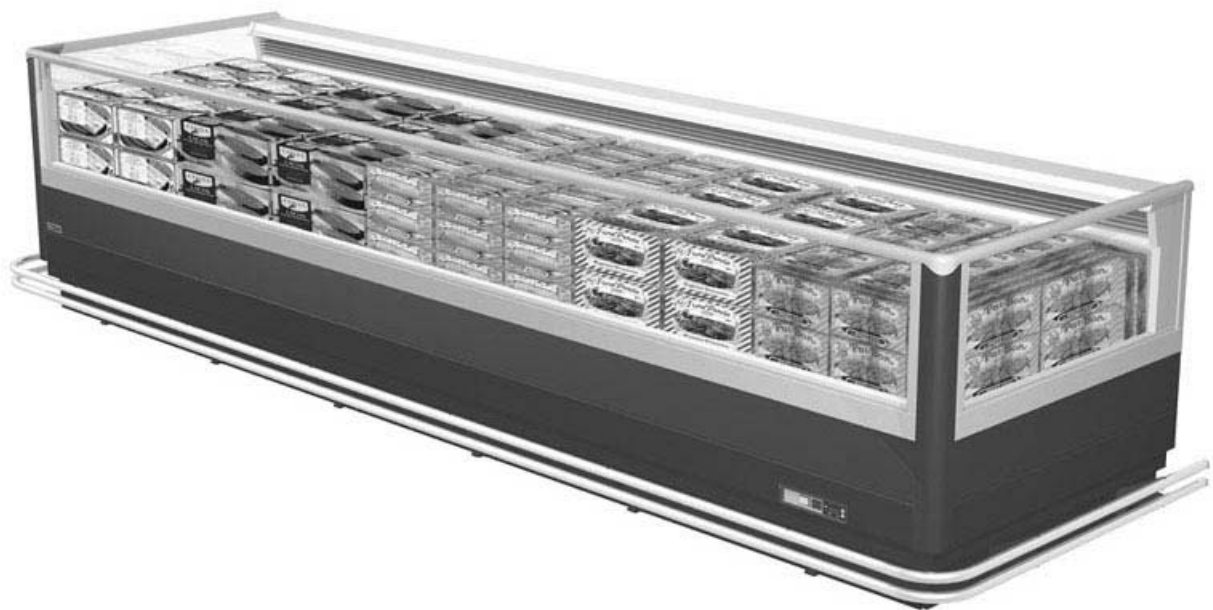


instructions for installation



LEOPARD



COSTAN[®] [®]
REFRIGERATION
● member of Epta-Group

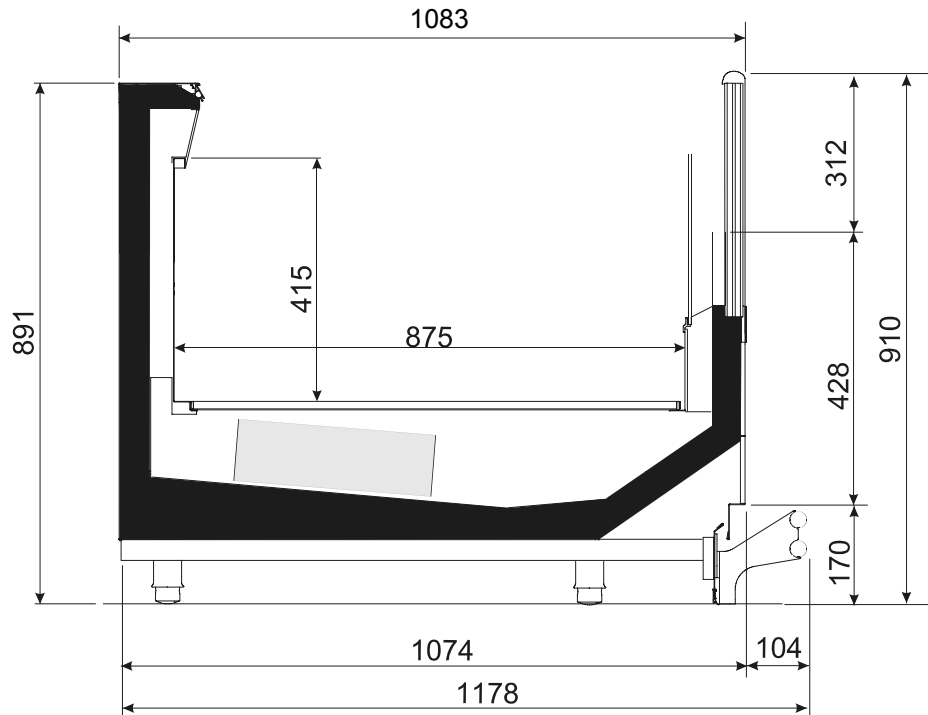
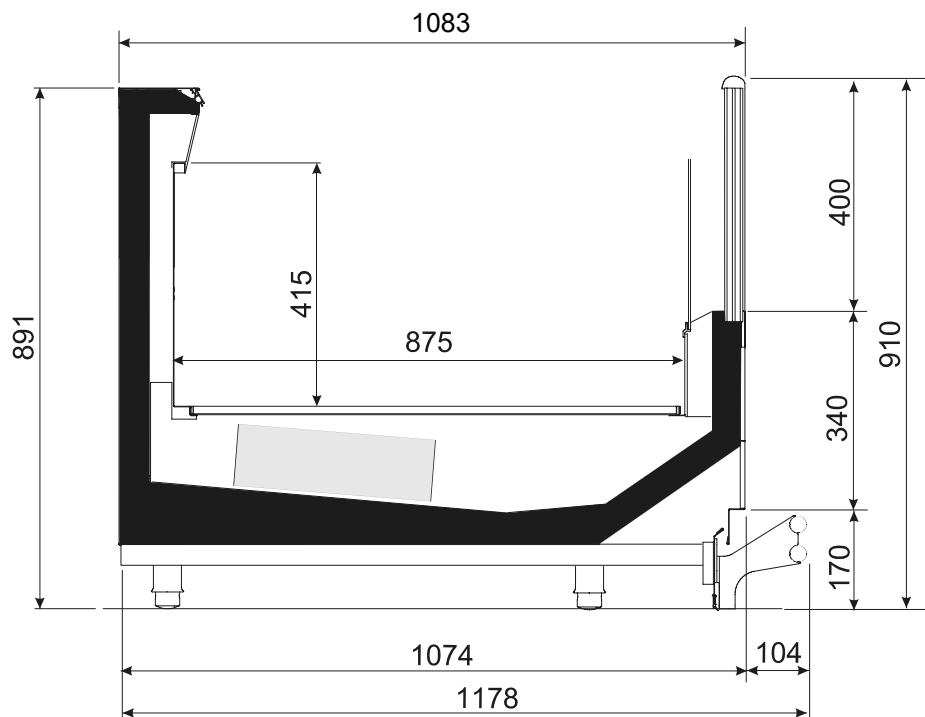
COSTAN [®]	TECHNICAL DOCUMENTATION	CHAPTER REVISION STATUS				SIGNED AS IN CONFORMITY WITH APPROVED ORIGINAL	PAGE: 1/1
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CHAP. No. 1							
CHAPTER: CONTENTS							

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3	INSTALLATION DIAGRAMS	5	B
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5	REQUIRED HEAT EXTRACTION RATE	2	B
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7	THERMOSTATIC VALVE FEATURES	8	B
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9	WIRING DIAGRAMS	15	A
10	MULTIPLEXING CABINETS	6	A
11	MULTIPLEXING BACK TO BACK CABINET	2	A
11.1	ASSEMBLY OF ELECTRICAL BOARD	1	"_"
11.2	EXTRACTION OF ELCTRICAL BOARD	1	"_"
11.3	ASSEMBLY OF PLEXIGLASS DIVIDERS	2	"_"
12	ASSEMBLY OF OPTIONAL STAINLESS-STEEL BUMPER RAILS	5	"_"
13	ASSEMBLY OF OPTIONAL NIGHT BLINDS	1	"_"

KEY

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

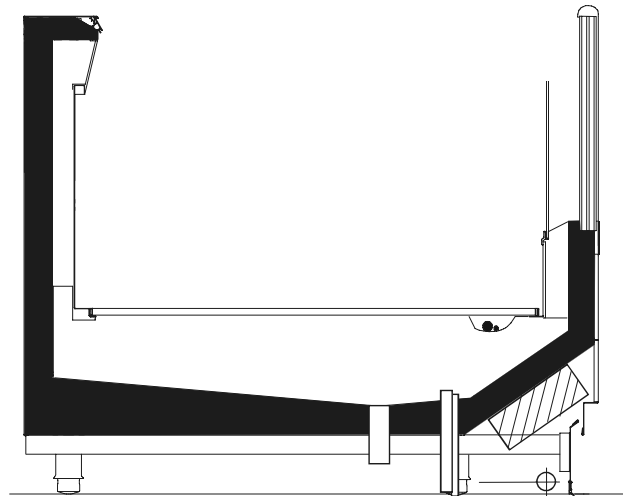
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LEOPARD LG300**LEOPARD HG400**

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	C		F			

INSTALLATION DIAGRAMS

CONNECTIONS - CROSS SECTION



water drain outlet Ø40

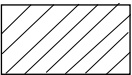

route of refrigerating pipes

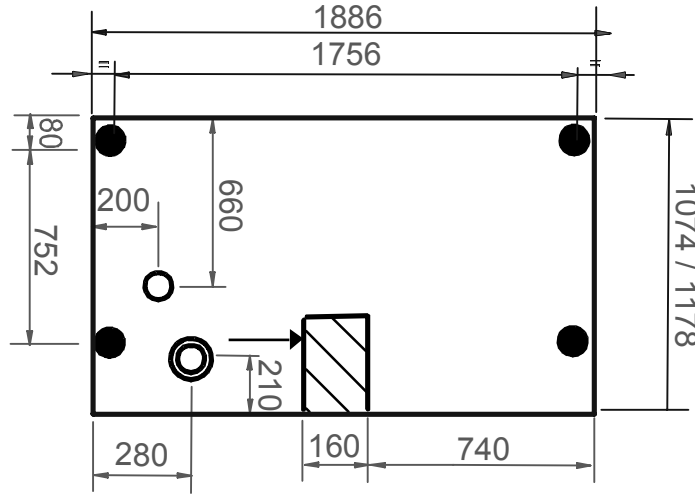
Refrigerating connection
inlet Ø 10 mm
outlet Ø 20 mm

electrical board

route of drain piping

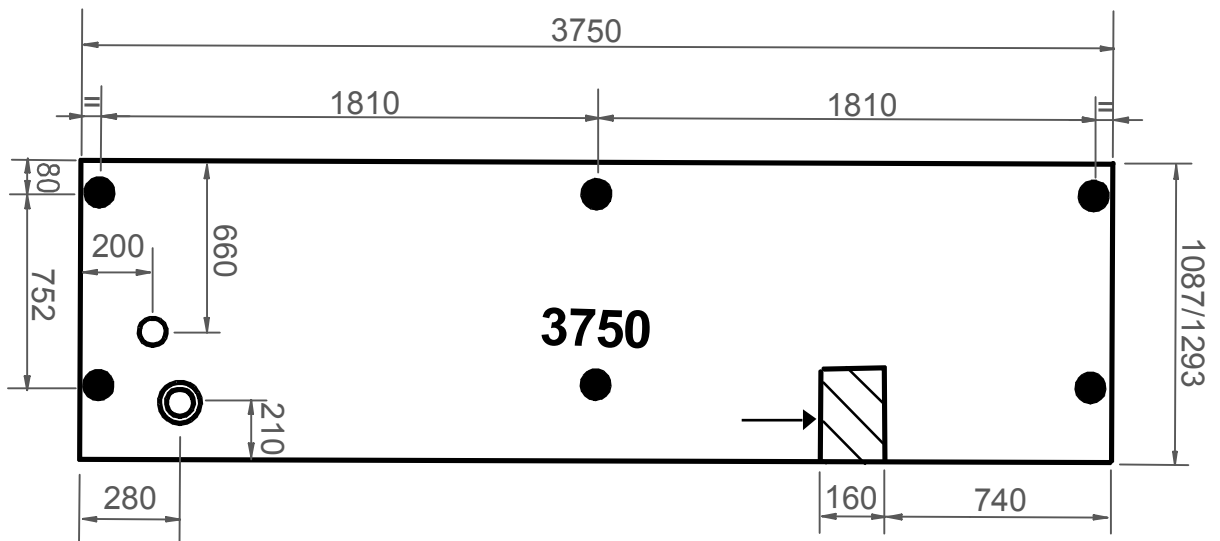
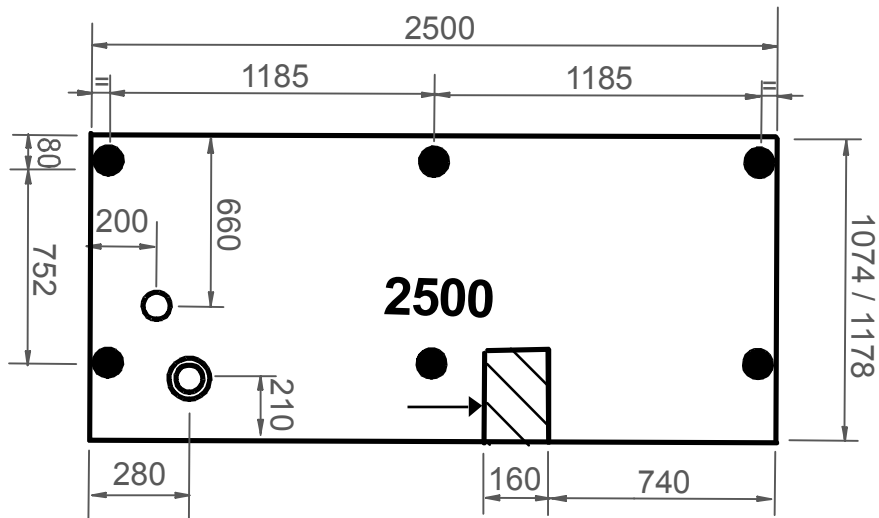
CONNECTIONS - PLAN FOR LEOPARD LINEAR CABINET - without end panels

- feet
- water drain outlet Ø40
- ⊙ refrigerating connection
-  electrical board
-  electrical board inlet



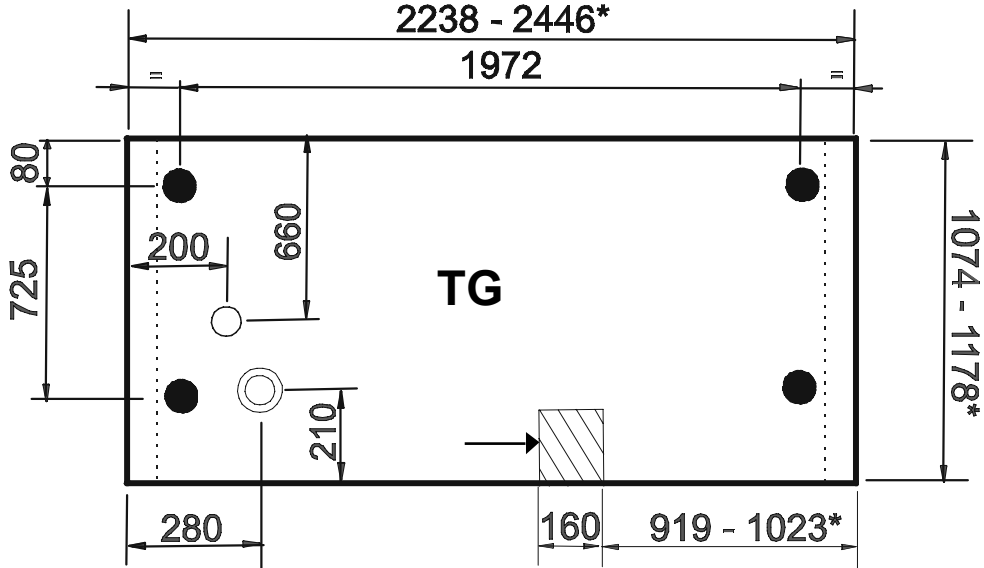
Thickness of blind end panel = 51mm
Thickness of glass end panels = 70 mm

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


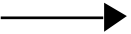


COSTAN TECHNICAL DOCUMENTATION	CHAPTER REVISION STATUS				SIGNED AS IN CONFORMITY WITH APPROVED ORIGINAL	PAGE : 3/5
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CHAPTER: INSTALLATION DIAGRAMS						

CONNECTIONS - PLAN FOR LEOPARD HEAD CABINET



* - optional bumper rail

- feet
- water drain outlet Ø40
- ⊙ refrigerating connection
-  electrical board
-  electrical board inlet

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.

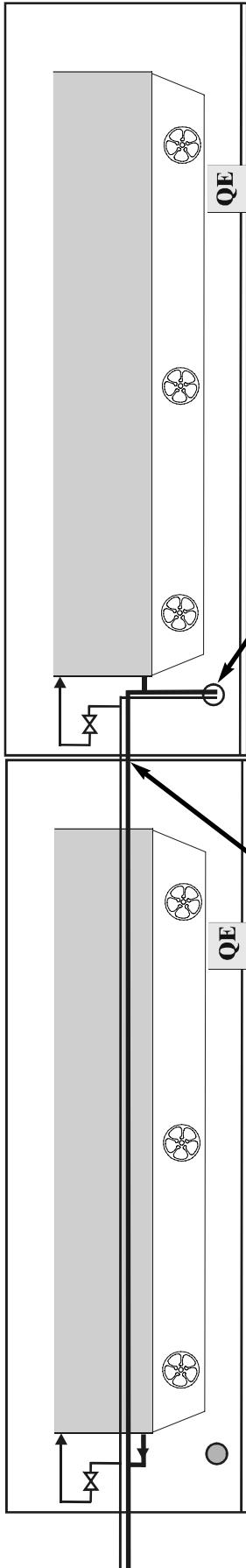
In this case signal transmission between MASTER and SLAVE needs to be inverted. The cable in question must be connected in series to the long cable (for further details, see relevant wiring diagram).



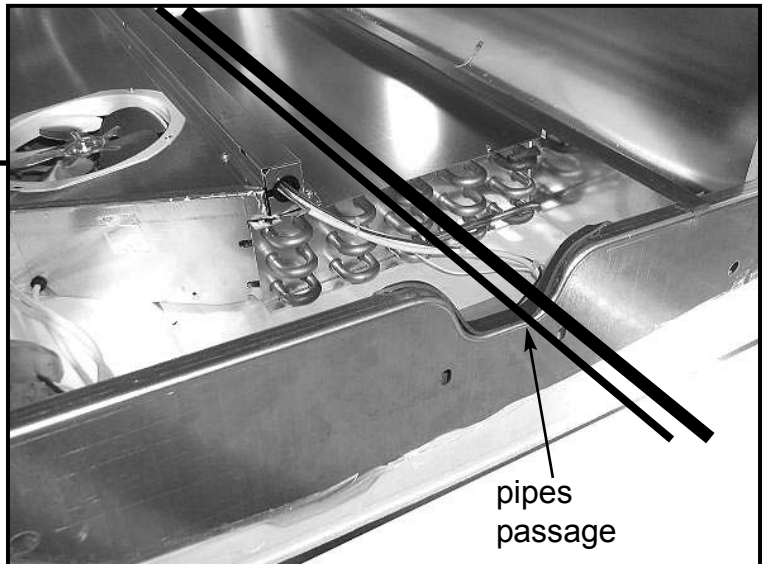
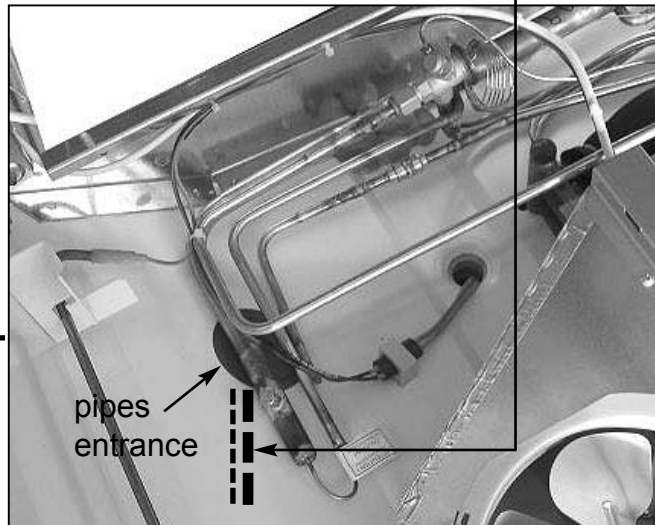
CAUTION: do not fully unscrew the feet of the cabinet.
the height of the handrail from the heart has to be of 910mm.

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REFRIGERATING CONNECTION IN THE CHEST



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



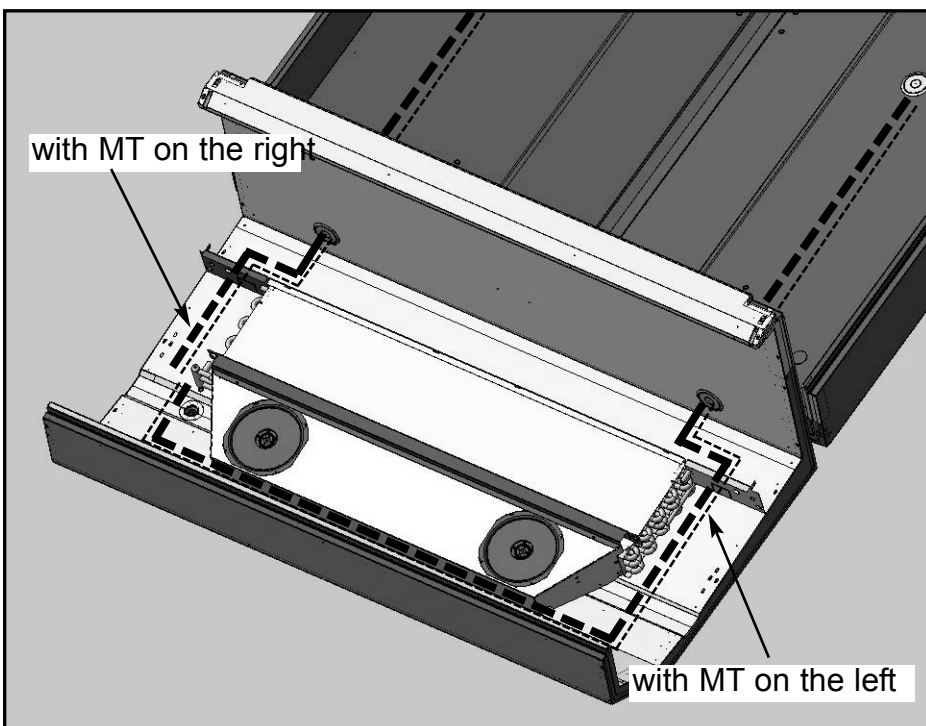
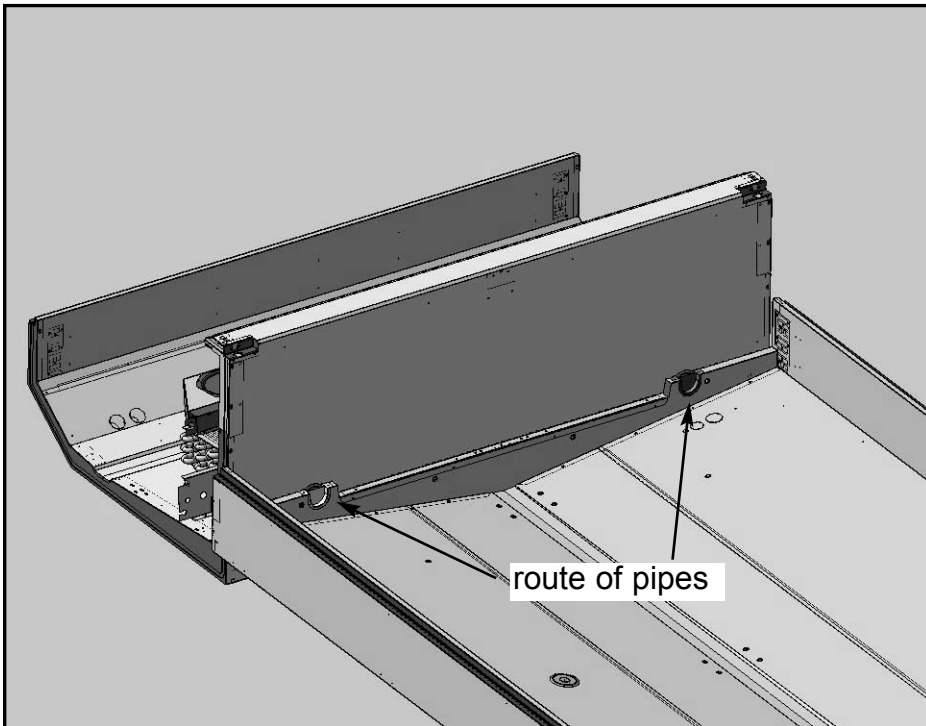
— liquid line
 — suction line

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REFRIGERATING CONNECTION IN THE CHEST HEAD CASE

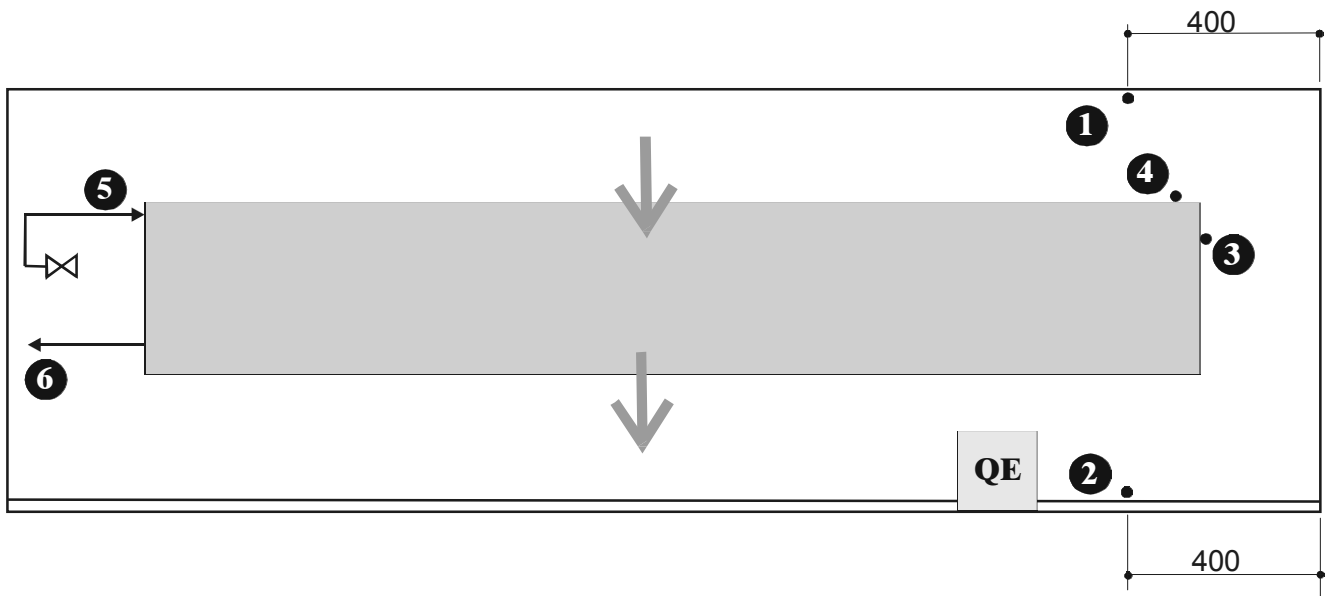
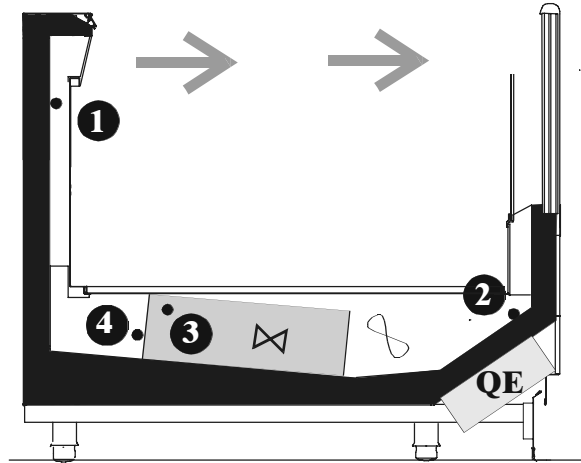
The route of pipes entering the cabinets is on the back of the cabinet, where the piping enters straight cabinets

As for the route of pipes between straight cabinets and MTs, follow the diagram below.



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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 mm

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CABINET: LEOPARD	DOC. N° QSM000259E				DATE of 1st ISSUE: 30.September.05	
CHAP. No. 5	CHAPTER: HEAT EXTRACTION RATE					

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 <i>Electric</i> 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 <i>Electric</i> Elettrico	2	+5	25	0	0

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

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CHAP. No. 5	CHAPTER: HEAT EXTRACTION RATE					

REFRIGERATION CAPACITY VARIATIONS WITH CLIMATE CLASS

CLA	Température bulbe sec	Humidité relative	Facteur de correction pour bilan thermique	Correction température d'évaporation	Dégivrage
	<i>Dry bulb temperature</i>	<i>Relative humidity</i>	<i>Correction factor for heat extraction rate</i>	<i>Evaporating temperature correction</i>	<i>Defrost</i>
	Temperatura bulbo secco	Umidità relativa	Fattore di correzione per la potenza frigorifera	Correzione della temperatura di evaporazione	Sbrinamento
	°C	%	Φ_o	T_o	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)		3
6	27	70	x 1,2		

SETTINGS IN STORE CONDITIONS

M	Temps de sécurité pour les dégivrages <i>Safety time for defrost</i> tempo massimo di sbrinamento	Alarme hors période de dégivrage <i>Alarm out of defrost time</i> Allarmi fuori dal periodo di sbrinamento			Température maxi de l'air à la reprise hors période de dégivrage <i>Maxi air temperature at the air return out of defrost time</i> Massima temperatura dell'aria fuori dal periodo di sbrinamento	
		Seuil <i>Threshold</i> Soglia	Temporisation <i>Delay time</i> Ritardo	Période d'occultation après fin de dégivrage <i>Minimum time after defrost termination</i> tempo di ritardo allarme dopo lo sbrinamento		
		min	°C	min		min
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.

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CHAPTER: HEAT EXTRACTION RATE						

PRICIPLE OF OPERATION

		NORMAL OPERATION	DEFROSTING	NORMAL OPERATION
FANS	ON	—————		
	OFF	—————		
EVAPORATOR	ON		—————	
	OFF	—————		—————
DRIP-TRAY HEATER	ON		—————	
	OFF	—————		—————
AIR-INLET HEATER	ON		—————	
	OFF	—————		—————
SOLENOID	ON	—————		—————
	OFF		—————	

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CHAPTER: ELECTRICAL INPUT	F					

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 <i>Fans</i> Ventilatori			Cordons chauffants <i>Heaters</i> Antiappannanti						Dégivrage <i>Defrost</i> Sbrinamento								
		230 Vac mono 50 Hz												Gaz chaud / Hot gas / Gas caldo		électrique / Electric / Elettrico			
														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 <i>Fans</i> Ventilatori			Cordons chauffants <i>Heaters</i> Antiappannanti			Dégivrage <i>Defrost</i> 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
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

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CABINET: LEOPARD CHAP N°: 7 CHAPTER: THERMOSTATIC VALVE FEATURES				F		DATE of 1st ISSUE: 30.09.05



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

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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 THERMOSTATICA 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

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CARACTERISTIQUES DETENDEURS ELECTRONIQUES MARQUE DANFOSS
ELECTRONIC EXPANSION VALVES REQUIREMENTS TRADE MARK DANFOSS

H-

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 recommended 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

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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 recommended 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

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**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 THERMOSTATICA 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-refroidissement 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

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**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

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CARACTERISTIQUES DETENDEURS ELECTRONIQUES MARQUE DANFOSS
ELECTRONIC EXPANSION VALVES REQUIREMENTS TRADE MARK DANFOSS

H-

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 recommended 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 <i>MODEL</i> TIPO	ORIFICE <i>ORIFICE</i> ORIFICIO		
			Sous-refroidissement <i>Subcooling</i> 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

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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 recommended 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

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

OTHER PARAMETERS	DISPLAY	UNITA'	Leopard	Leopard
			TN	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 defrost	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 RELAY ON / 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 - FANS ON - NO ALARM / 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=R134a;8=R407A;9=R407C;10=R407B;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;28=R744;29=R1270;30=R417A)	o30		*	*

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

DESCRIPTION OF PARAMETERS	DISPLAY	UNIT	Default	Leopard	Leopard
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

*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

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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

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

DESCRIPTION OF PARAMETERS	DISPLAY	UNIT	Leopard	Leopard
			TN	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 defrost	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 RELAY ON / 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 ON / 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=R134a;8=R134a;9=R134a;10=R134a;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

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

DESCRIPTION OF PARAMETERS	DISPLAY	UNIT	Default	Leopard	Leopard
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

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WIRING DIAGRAMS

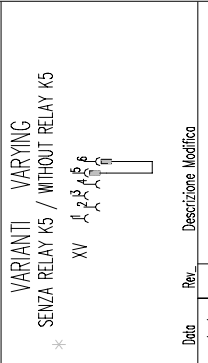
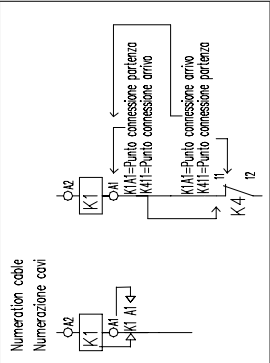
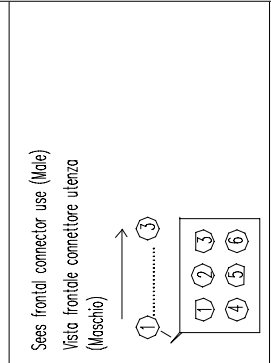
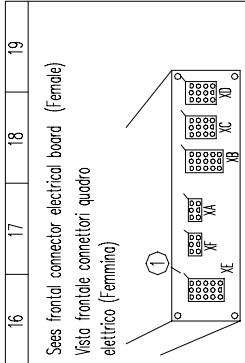
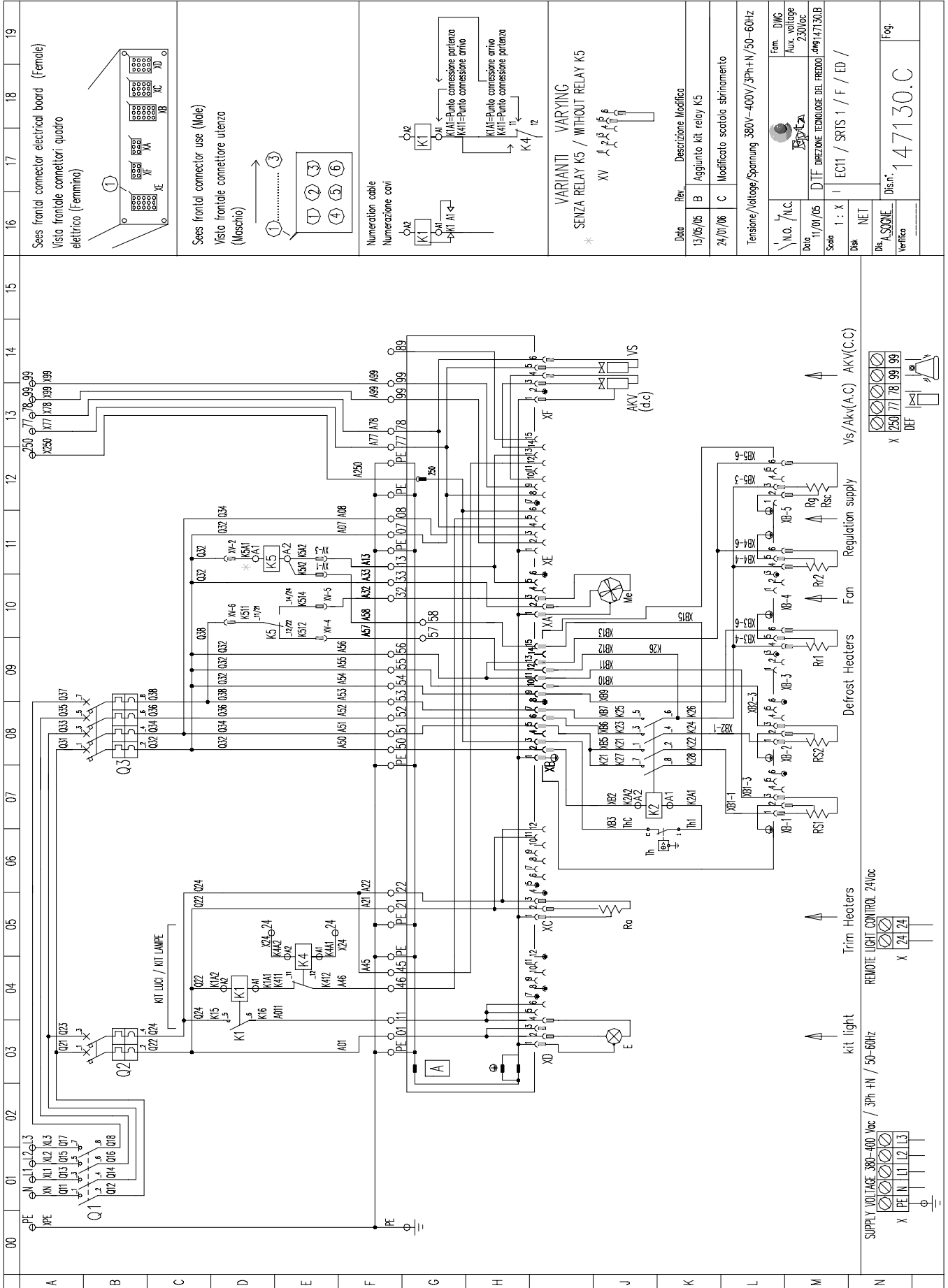
KEY TO THE WIRING DIAGRAM

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	Temperature 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

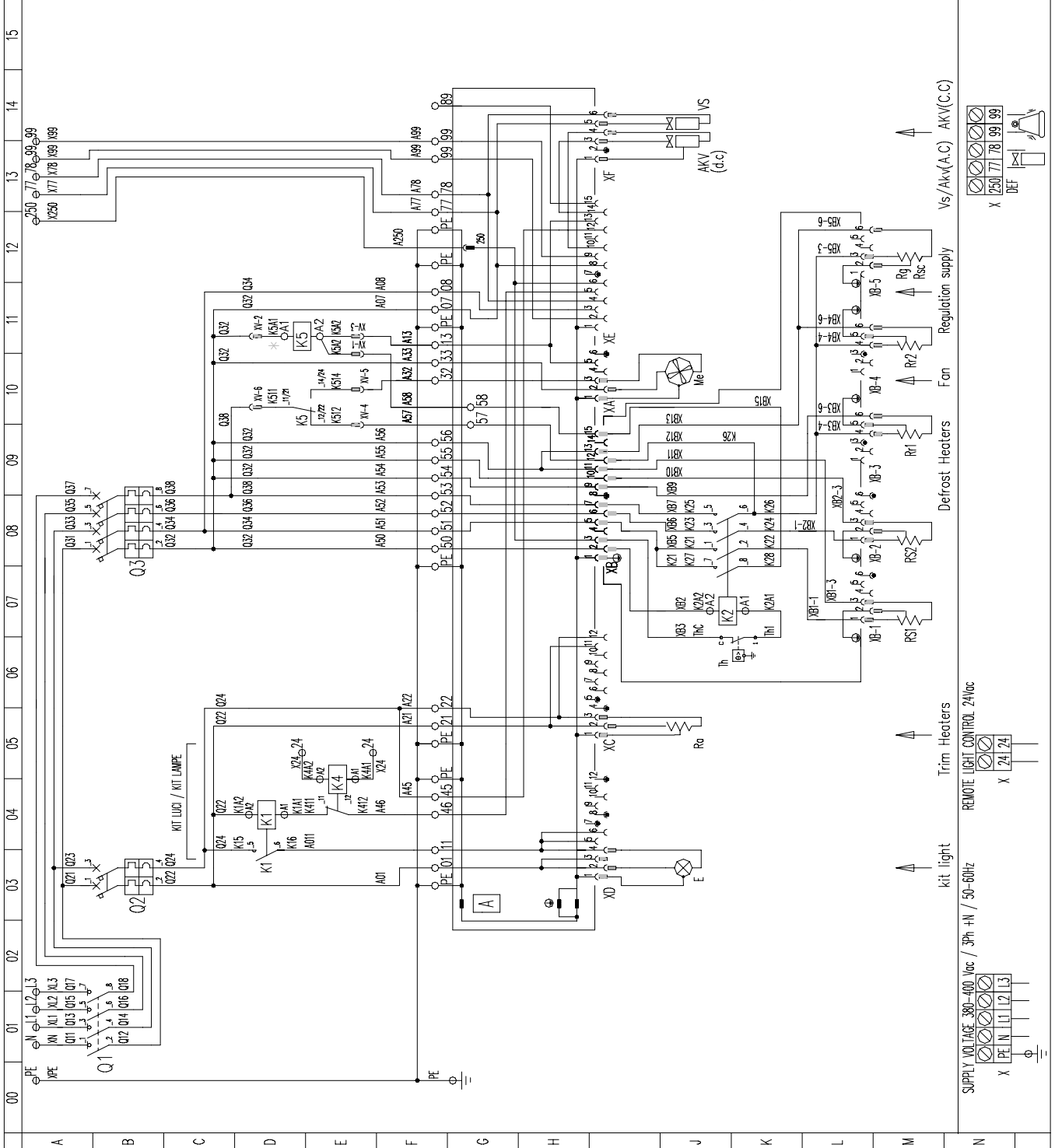
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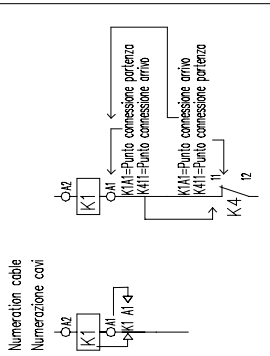
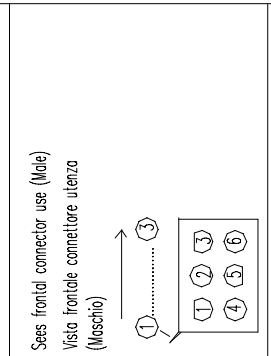
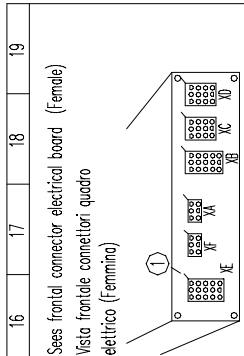
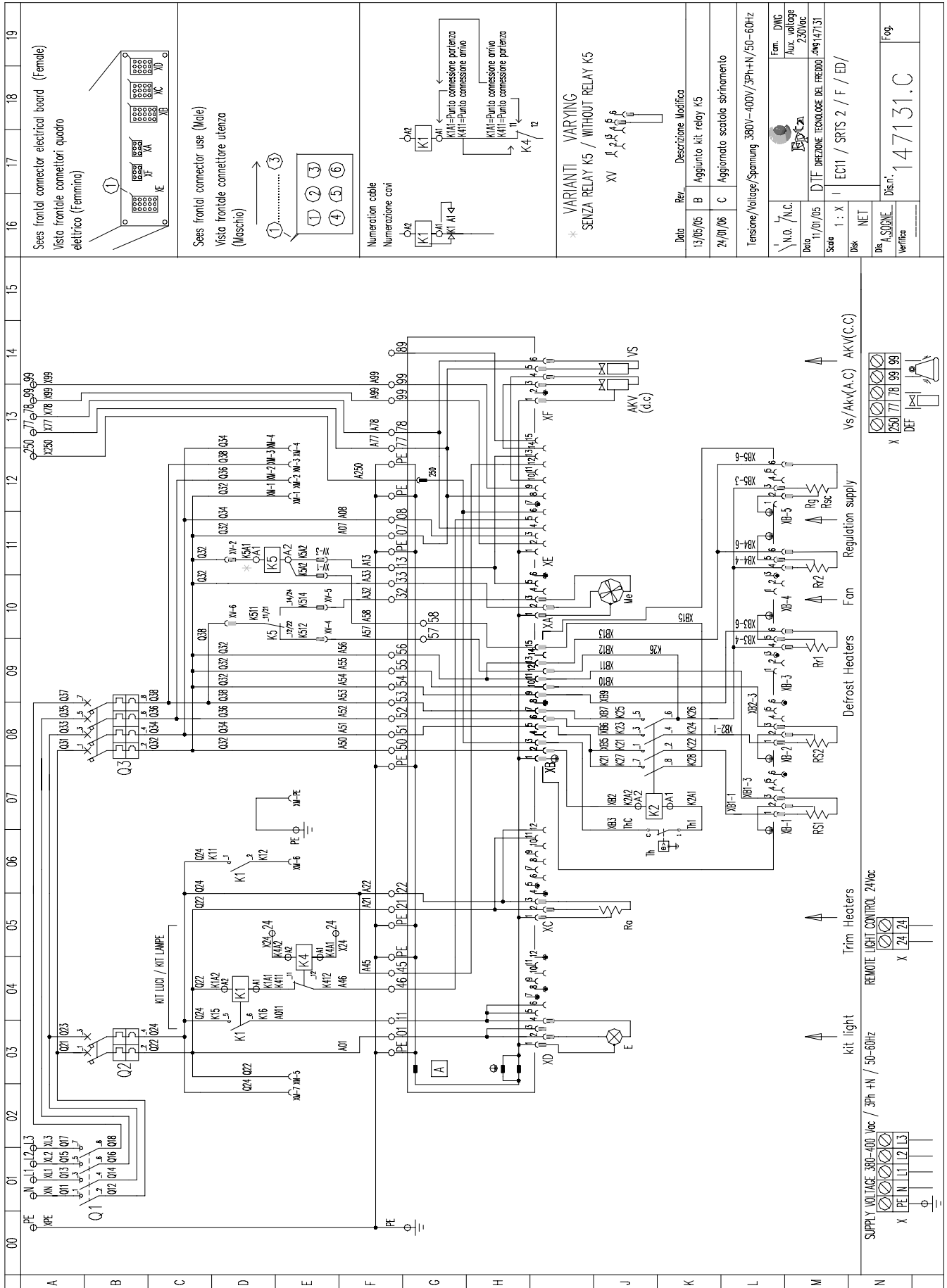
Data	Rev.	Descrizione Modifica
13/05/05	B	Aggiunto kit relay K5
24/01/06	C	Modificato scabolo sbrinatorio

Tensione/Voltage/Spinning 380V-400V/3Ph+N/50-60Hz

N.O. / N.C.	Em. DMG
11/01/05	Aux. voltage
DIF DIREZIONE TECNOLOGIE DEL FREDDO	230Vacc
Scala 1 : X	DMG 17130/B
Dis. NET	EC11 / SRTS 1 / F / ED /
Dis. ASSONIE	Dis.n° 147130.C
Verifica	Fog.



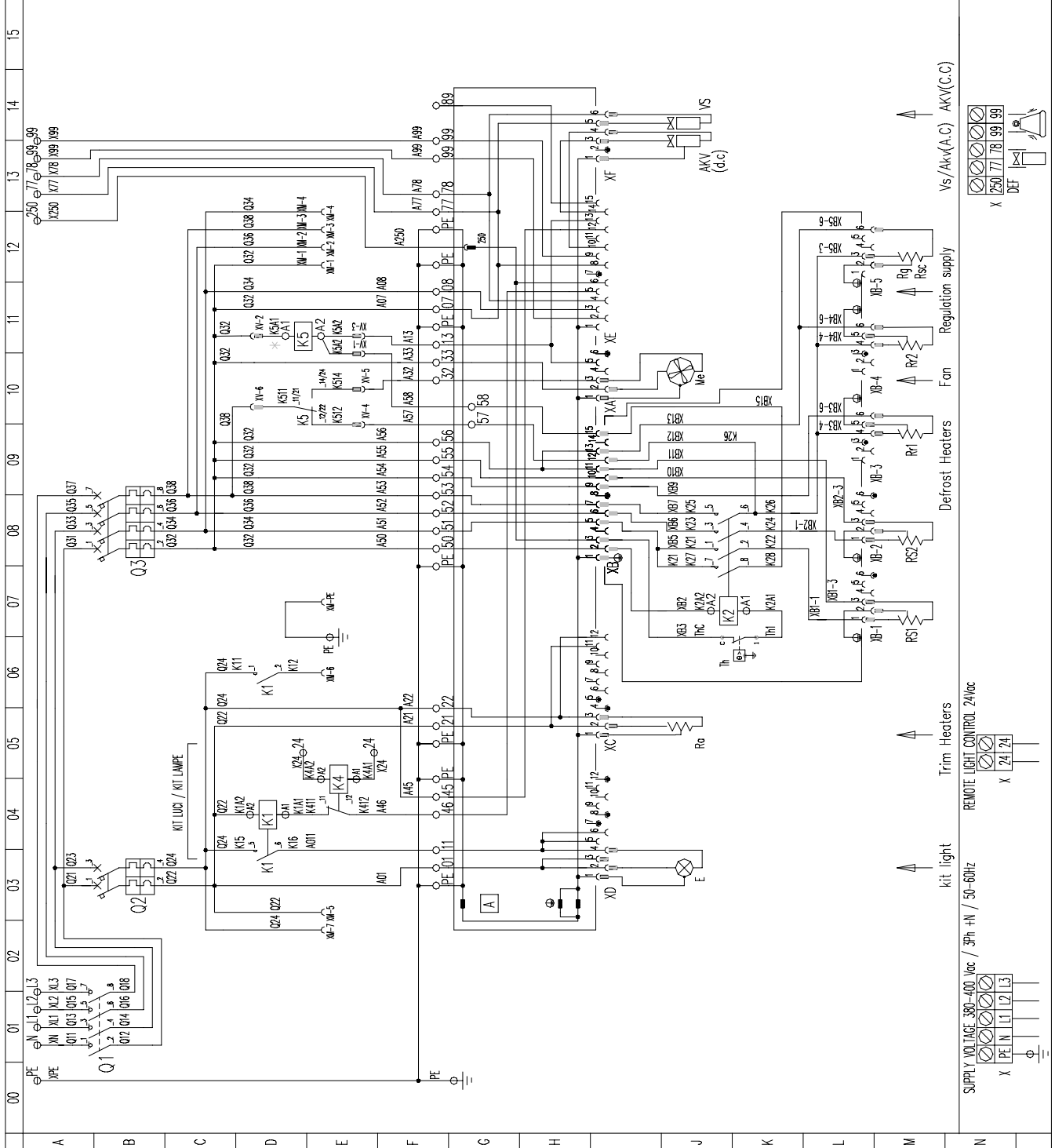
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* VARIANTI VARYING
 SENZA RELAY K5 / WITHOUT RELAY K5

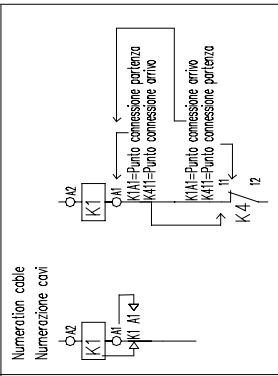
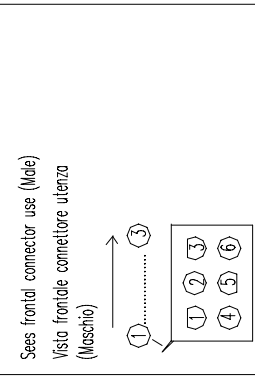
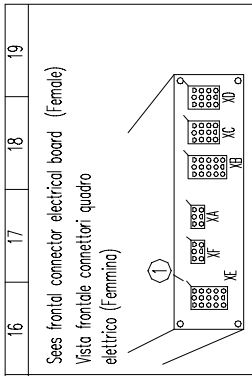
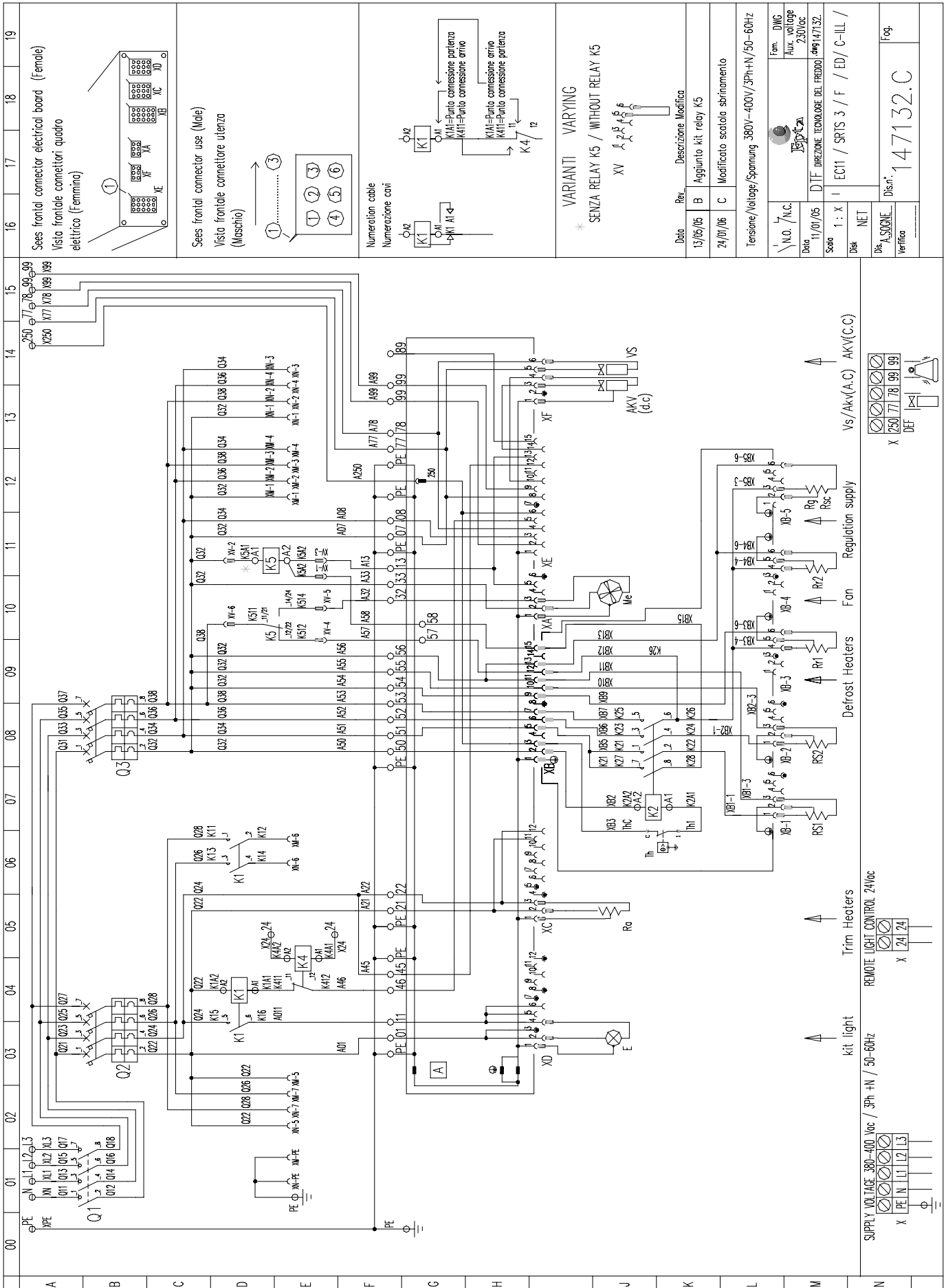
Data	Rev.	Descrizione/Modifica
13/05/05	B	Aggiunto kit relay K5
24/01/06	C	Aggiornato sciolto sbrinatorio

Tensione/Voltage/Spamung	380V-400V/3Ph+N/50-60Hz
Fam. DWG	
Aux. voltage	230V/0V
Data	11/01/05
Scale	1 : X
Dis. NET	EC11 / SPYS 2 / F / ED/
Dis. A.SOCI. Verifica	147131.C
Fog.	



SUPPLY VOLTAGE 380-400 Vcc / 3Ph + N / 50-60Hz	
REMOTE LIGHT CONTROL 24Vcc	
X 24 24	
X 230 77 78 99 99	
DF	

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VARIANTI VARYING
 * SENZA RELAY K5 / WITHOUT RELAY K5
 XV

Data	Rev.	Descrizione Modifica
15/05/05	B	Aggiunto kit relay K5
24/01/06	C	Modificato scottola sbrinatorio

Tensione/Voltage/Spannung 380V~400V/3Ph+N/50-60Hz

N.O. / N.C.	Form. DWG
Data 11/01/05	Aux. voltage 230Vacc
Scab 1 : X	DIF DIREZIONE TECNOLOGIE DEL FREDDO 09/147132
DisK	1 EC11 / SRTS 3 / F / ED / C-ILL /
Dis. A.S. SCONE	Dis.n. 147132.C
Verifico	Fog.

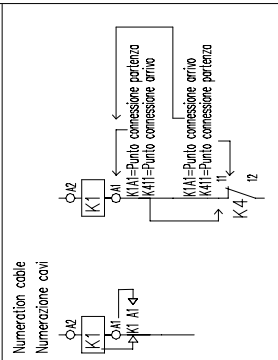
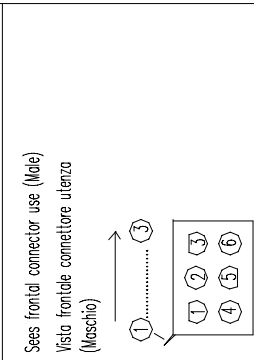
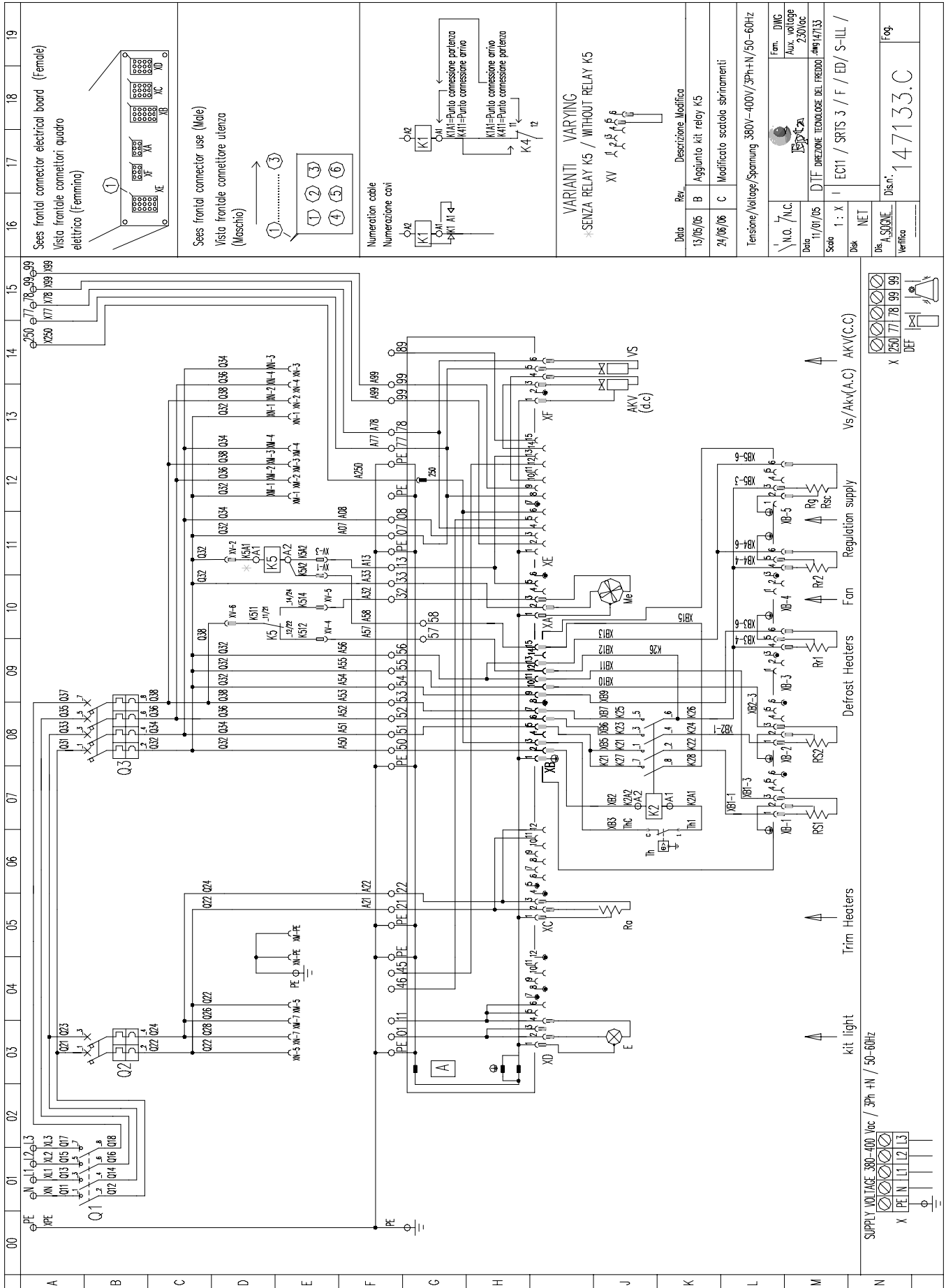
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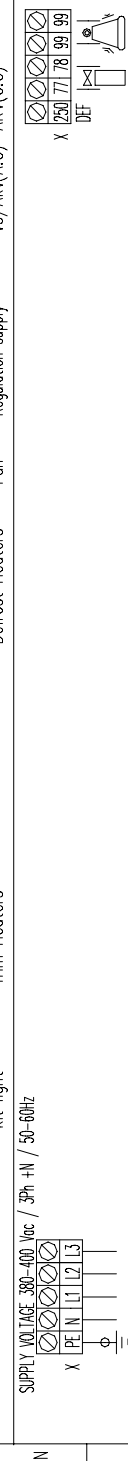
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13/05/05	B	Aggiunto kit relay K5
24/06/06	C	Modificato scatola sbrinatori

Tensione/Voltage/Spornung 380V-400V/3Ph+N/50-60Hz

N.O. / N.C.
 Data 11/01/05 D I F DIREZIONE TECNOLOGIE DEL FREDDO 0mg147133
 Scala 1 : X I EC11 / SPTS 3 / F / ED / S-ILL /
 Dis. A.SCOFFE
 Verifica Dis.n. 147133.C Fog.



CABINET: LEOPARD
 CHAP. No. **9** DOC No. **QSM000259E**
 CHAPTER: **WIRING DIAGRAMS**

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Sees frontal connector board (Female)
 Vista frontale connettori quadro elettrico (Femmina)

Sees frontal connector use (Male)
 Vista frontale connettore utenza (Maschio)

Numeration cable
 Numerazione cavi

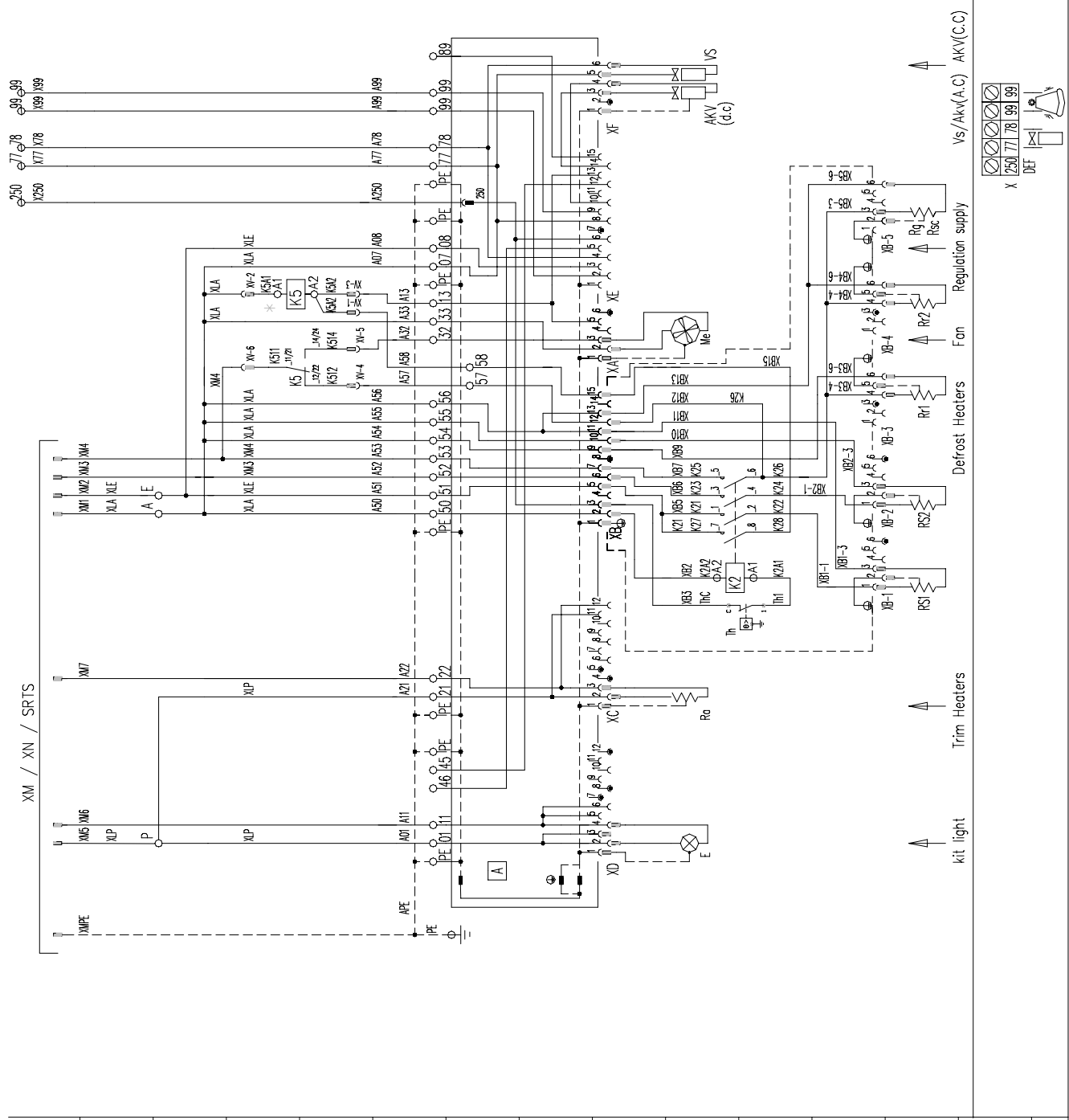
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* SENZA RELAY K5 / WITHOUT RELAY K5

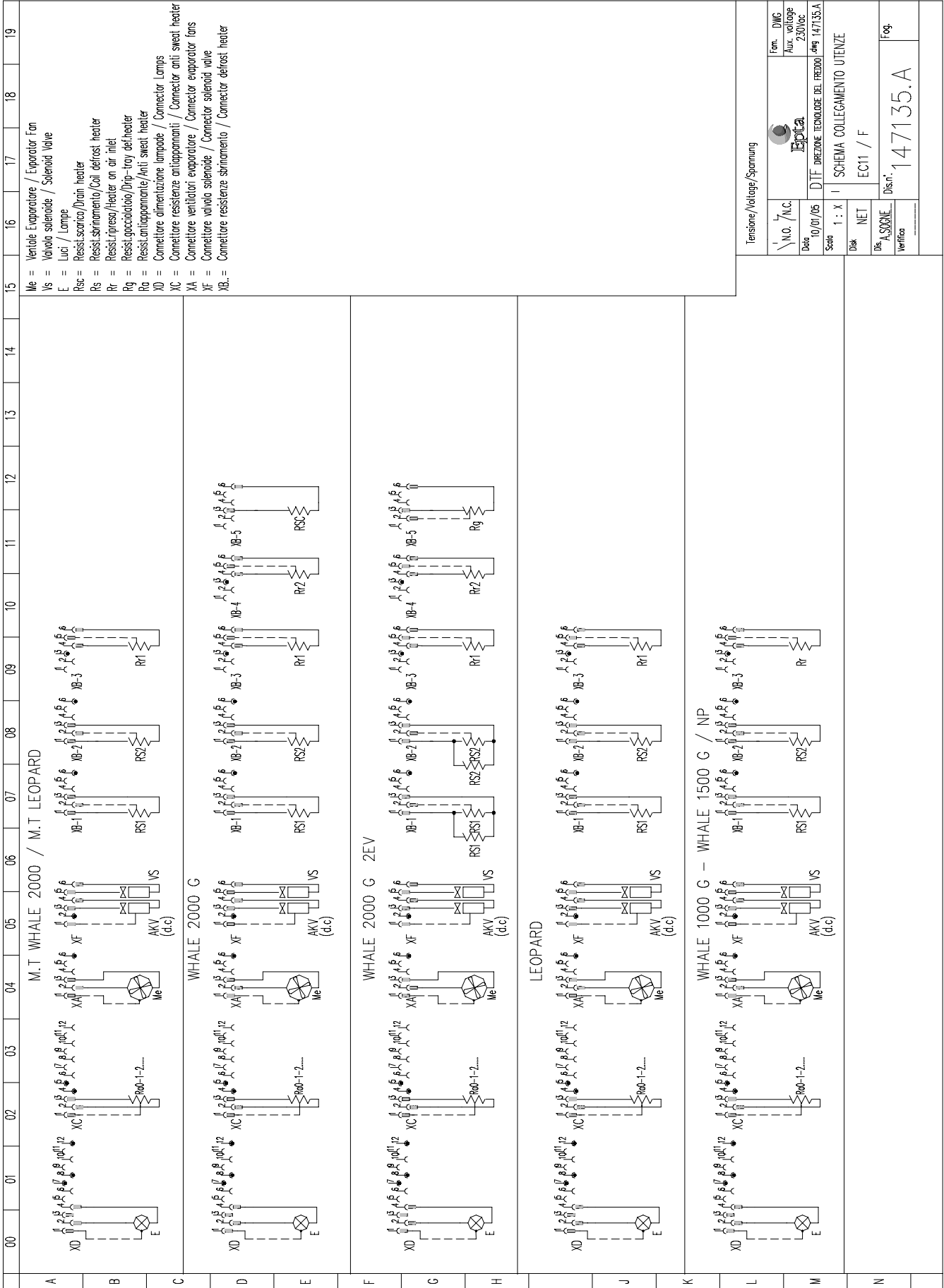
Data	Rev.	Descrizione Modifica
13/05/05	B	Aggiunto kit relay K5
25/01/06	C	Modificato scatola sbrinatorio

Intensione/Voltage/Spannung 380V-400V/3Ph+N/50-60Hz

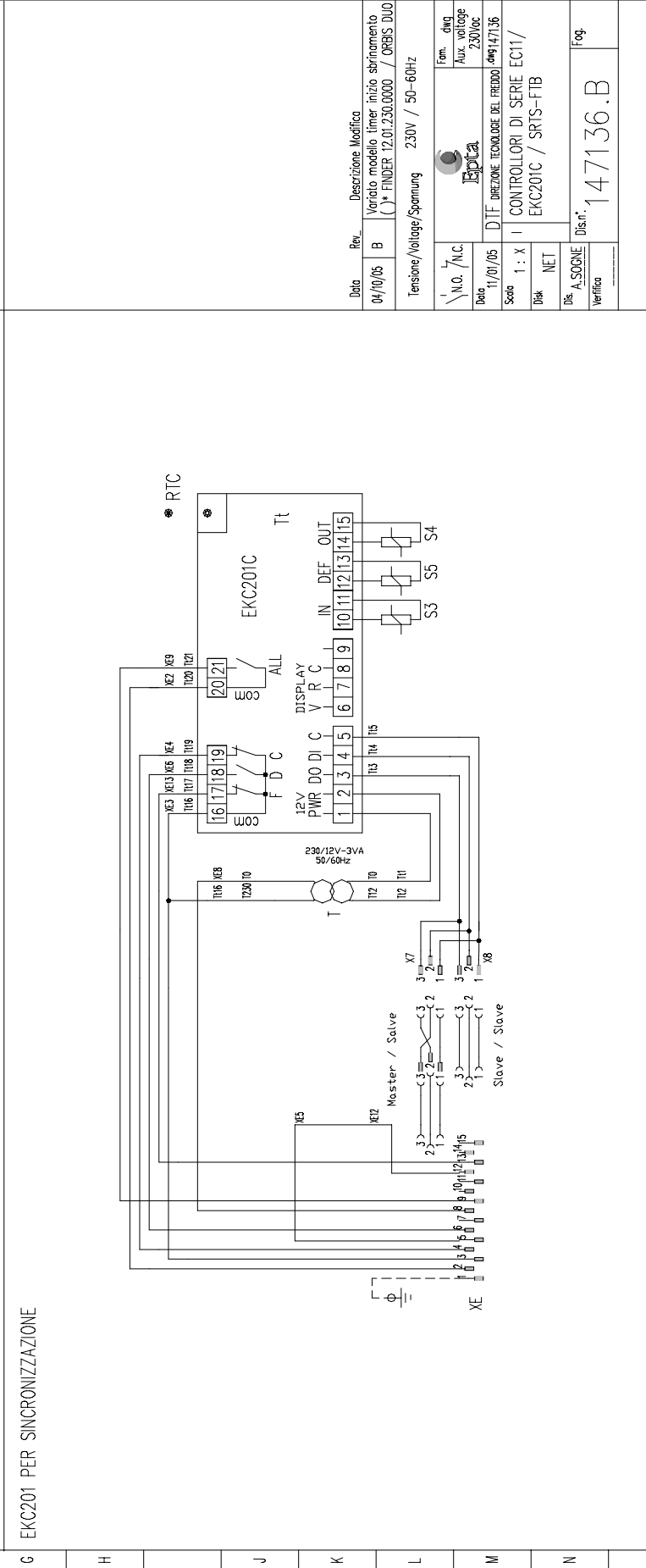
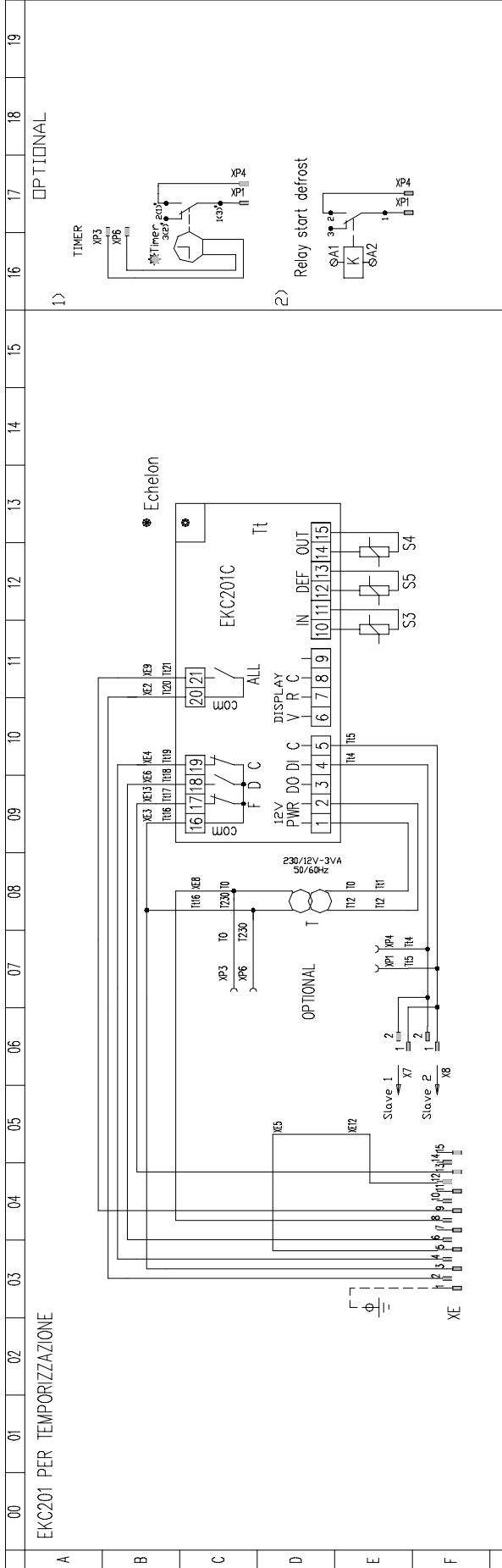
N.O. / N.C.	Fem. / D.M.C.
11/01/05	Aux. voltage 230Vcc
Scala 1 : X	DIREZIONE TECNOLOGIE DEL FREDDO 049147134
Disk NET	EC11 / FIB / F / ED /
Dis. ASSIEME	Disin. 147134.C
Verifica	



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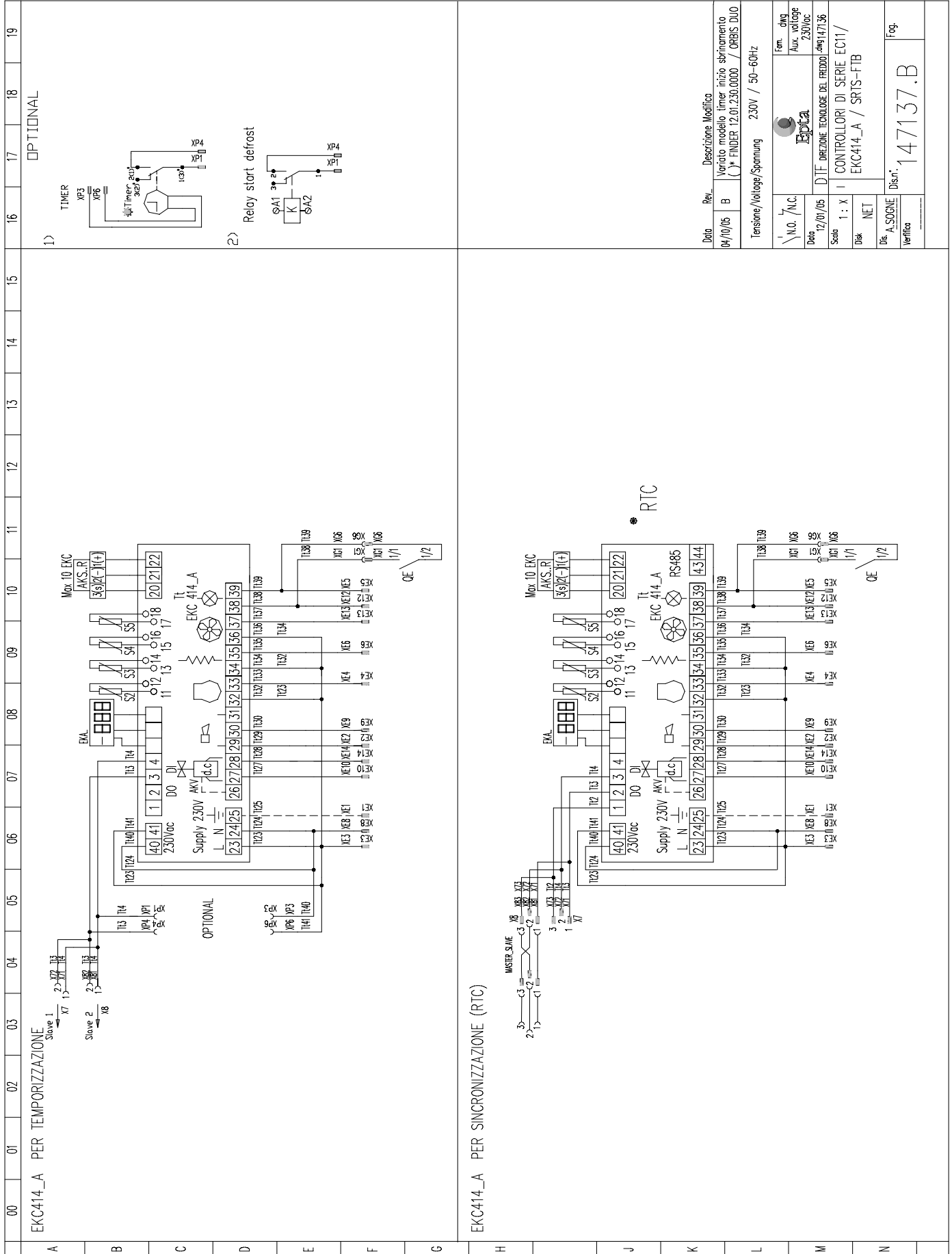
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04/10/05	B	Variato modello timer inizio sbrinatorio (*) FINDER T2.01230.0000 / ORSIS DUO

Tensione/Voltage/Spamung 230V / 50-60Hz

N.O.	/N.C.	Fem. cing.
		Aux. voltage
		230V/50

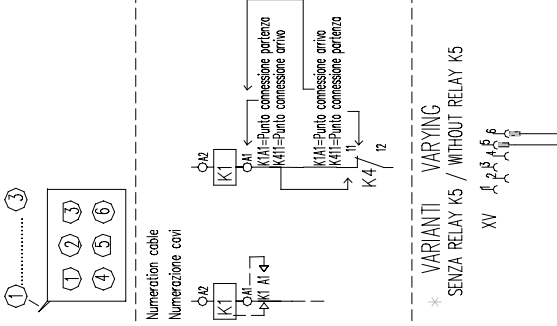
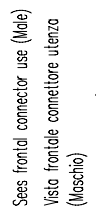
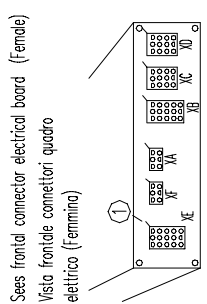
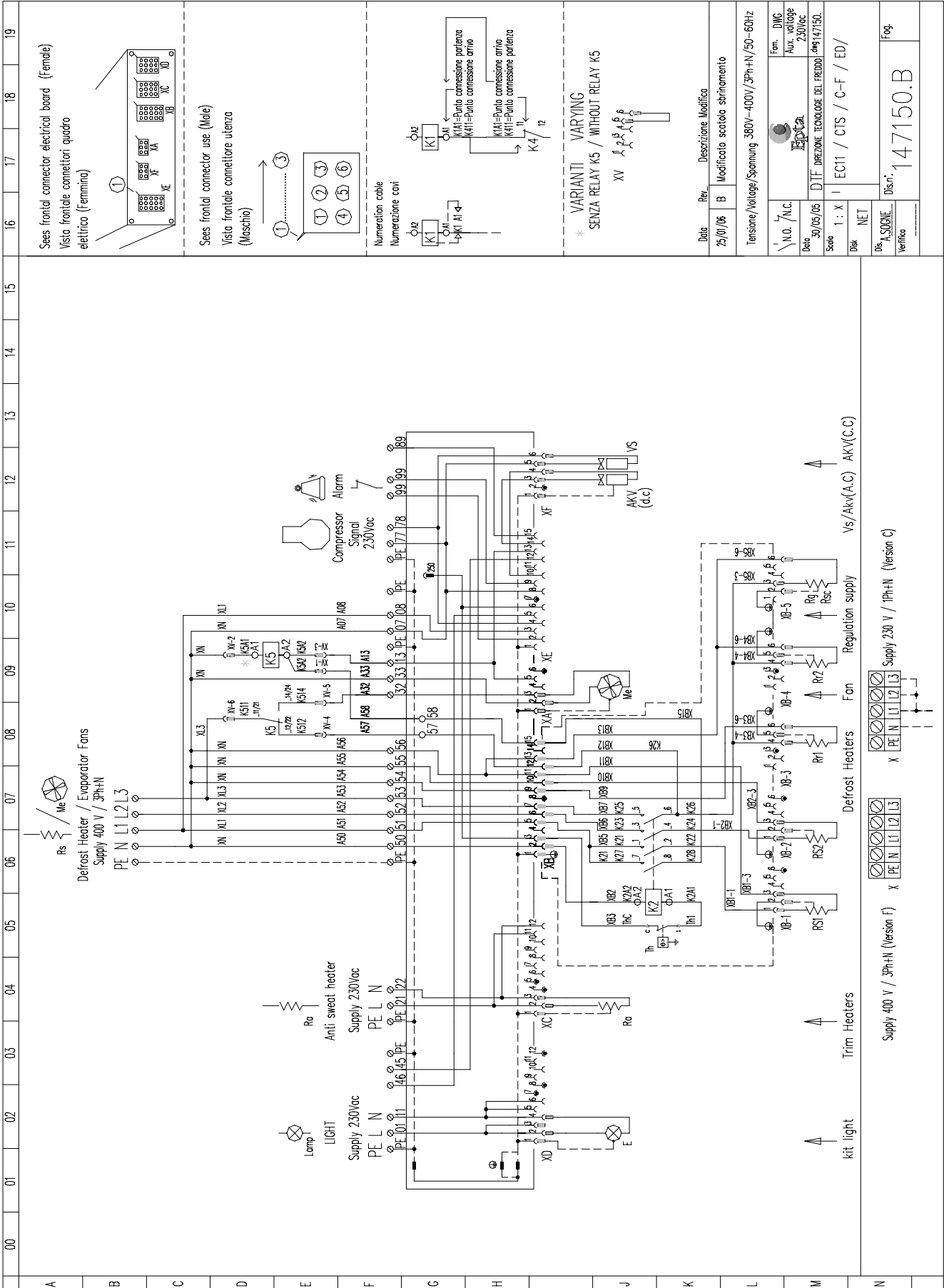
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 Scala 1 : X
 Dis. NET
 Dis. A. SOGNE
 Verifica
 Disan. 147136.B
 Fog.

ORD.	DATE	ORD.	DATE
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15	16	17	18	19												
OPTIONAL																
1)																
2)																
<table border="1"> <thead> <tr> <th>Dato</th> <th>Rev.</th> <th>Descrizione Modifica</th> </tr> </thead> <tbody> <tr> <td>04/10/05</td> <td>B</td> <td>Variato modello timer inizio sbrinatorio () FINDER 12.01.230.0000 / OFRBS DUO</td> </tr> </tbody> </table> <p>Tensione/Voltage/Spannung 230V / 50-60Hz</p> <table border="1"> <thead> <tr> <th>N.Ord.</th> <th>Aut.</th> <th>Aut. Voltage</th> </tr> </thead> <tbody> <tr> <td>12/01/05</td> <td></td> <td>230Voc</td> </tr> </tbody> </table> <p>Scad. 1: X Dis. NET Dis. A.SOCINE Verifica</p> <p>Dis.n. 147137.B</p>					Dato	Rev.	Descrizione Modifica	04/10/05	B	Variato modello timer inizio sbrinatorio () FINDER 12.01.230.0000 / OFRBS DUO	N.Ord.	Aut.	Aut. Voltage	12/01/05		230Voc
Dato	Rev.	Descrizione Modifica														
04/10/05	B	Variato modello timer inizio sbrinatorio () FINDER 12.01.230.0000 / OFRBS DUO														
N.Ord.	Aut.	Aut. Voltage														
12/01/05		230Voc														

ORD.	DATE	ORD.	DATE
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Data	Rev.	Descrizione Modifica
25/01/06	B	Modificato scottolo sbrinatorio

Tensione/Voltage/Spamung 380V-400V/3Ph-N/50-60Hz

N.O. / N.C.	Fam. DMG
	Aux. voltage 230V ac

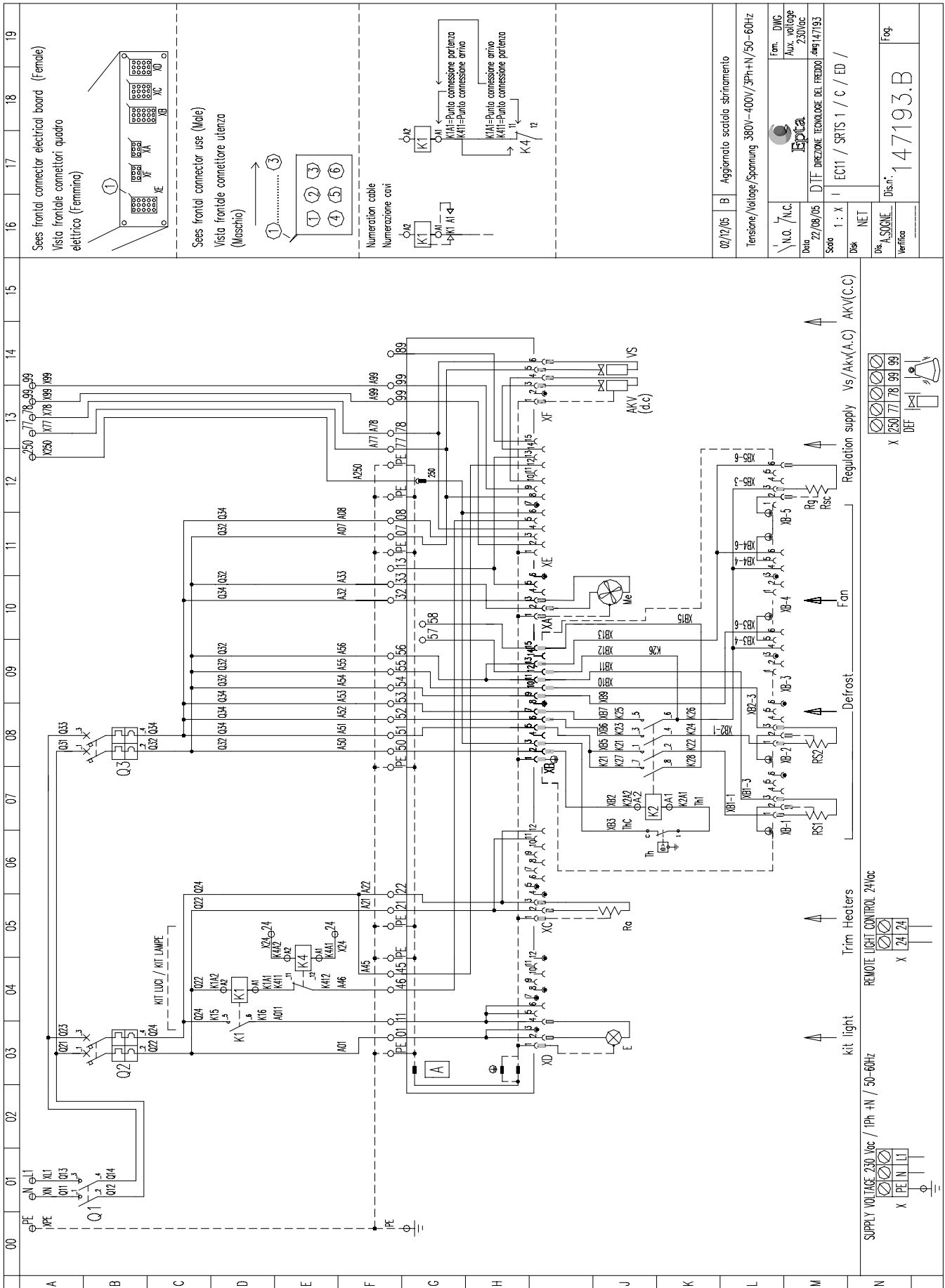
Data 30/05/05 DIF DIREZIONE TECNOLOGIE DEL FREDDO Ing.147150

Scale 1 : X I EC11 / CTS / C-F / ED/

Dis. A.S. SONE 147150.B

Verifica Fog.

CHAPTER REVISION STATUS			
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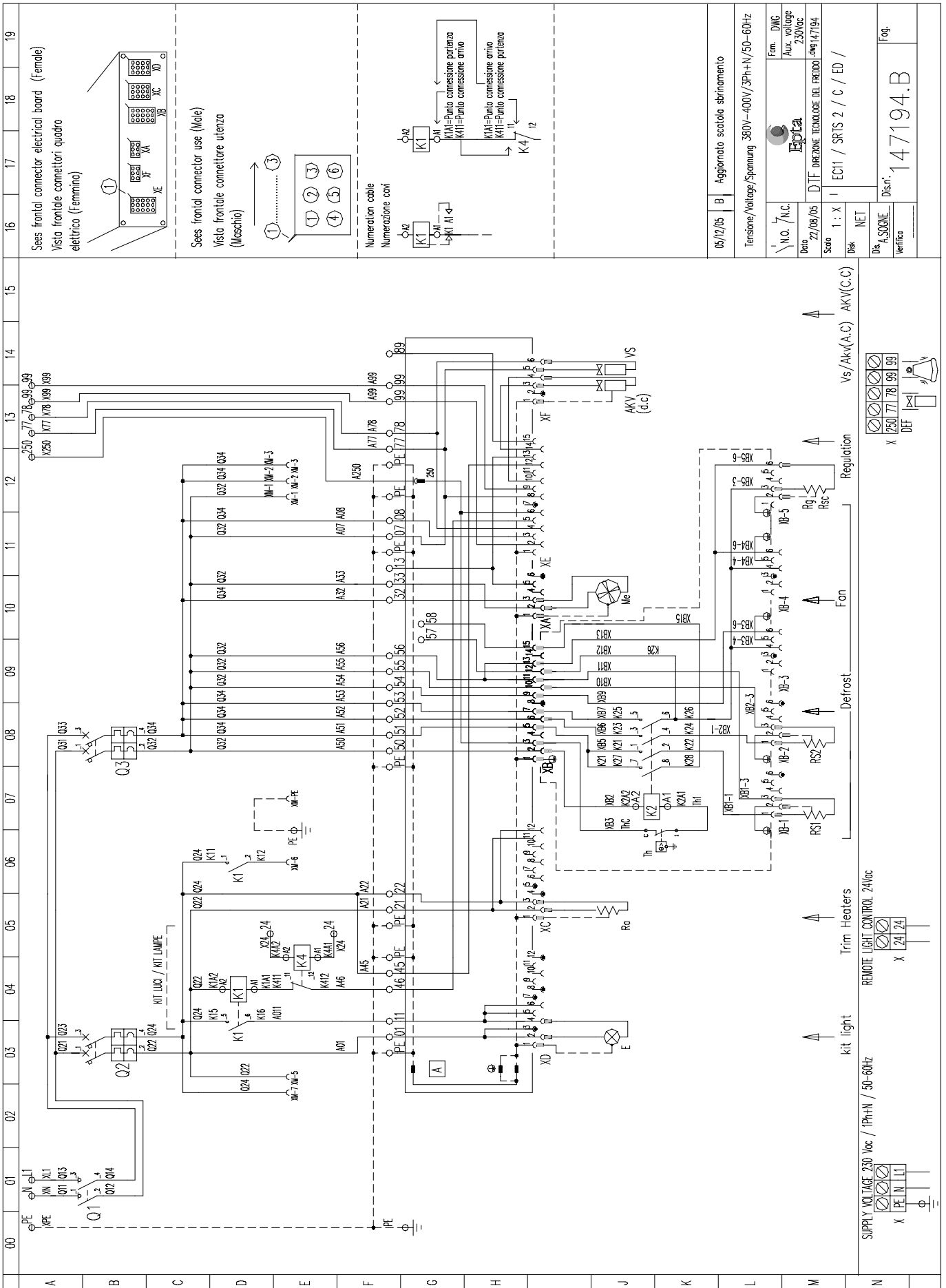
CHAPTER REVISION STATUS			
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CONFORMS TO APPROVED ORIGINAL

PAGE: **1/13**

CABINET: LEOPARD
 CHAP. No. **9** DOC No. **QSM000259E**
 CHAPTER: **WIRING DIAGRAMS**

DATE OF 1st ISSUE:
30.September.05



05/12/05	B	Aggiornato scatola sbrinatorio
Tensione/Voltage/Spennung 380V~400V/3Ph+N/50-60Hz		
N.º	/N.C.	Fam. DWG
Data	22/08/05	Aux. voltage 230Vcc
Scala	1 : X	DIREZIONE TECNOLOGIE DEL FREDDO dnr147194
Dis.	NET	EC11 / SRTS 2 / C / ED /
Verifica		Dis.c.r. 147194.B
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Sees frontal connector electrical board (Female)
 Vista frontale connettori quadro elettrico (Femmina)

Sees frontal connector use (Male)
 Vista frontale connettore utenza (Maschio)

Numberation cable
 Numerazione cavi

Kit light
 Trim Heaters
 REMOTE LIGHT CONTROL 24Vcc
 X PE N L1
 X 24 24

Defrost
 Regulation
 Vs/Akv(A.C) AKV(C.C)

Fan
 X 250 77 78 99 99
 DEF

AKV (d.c)

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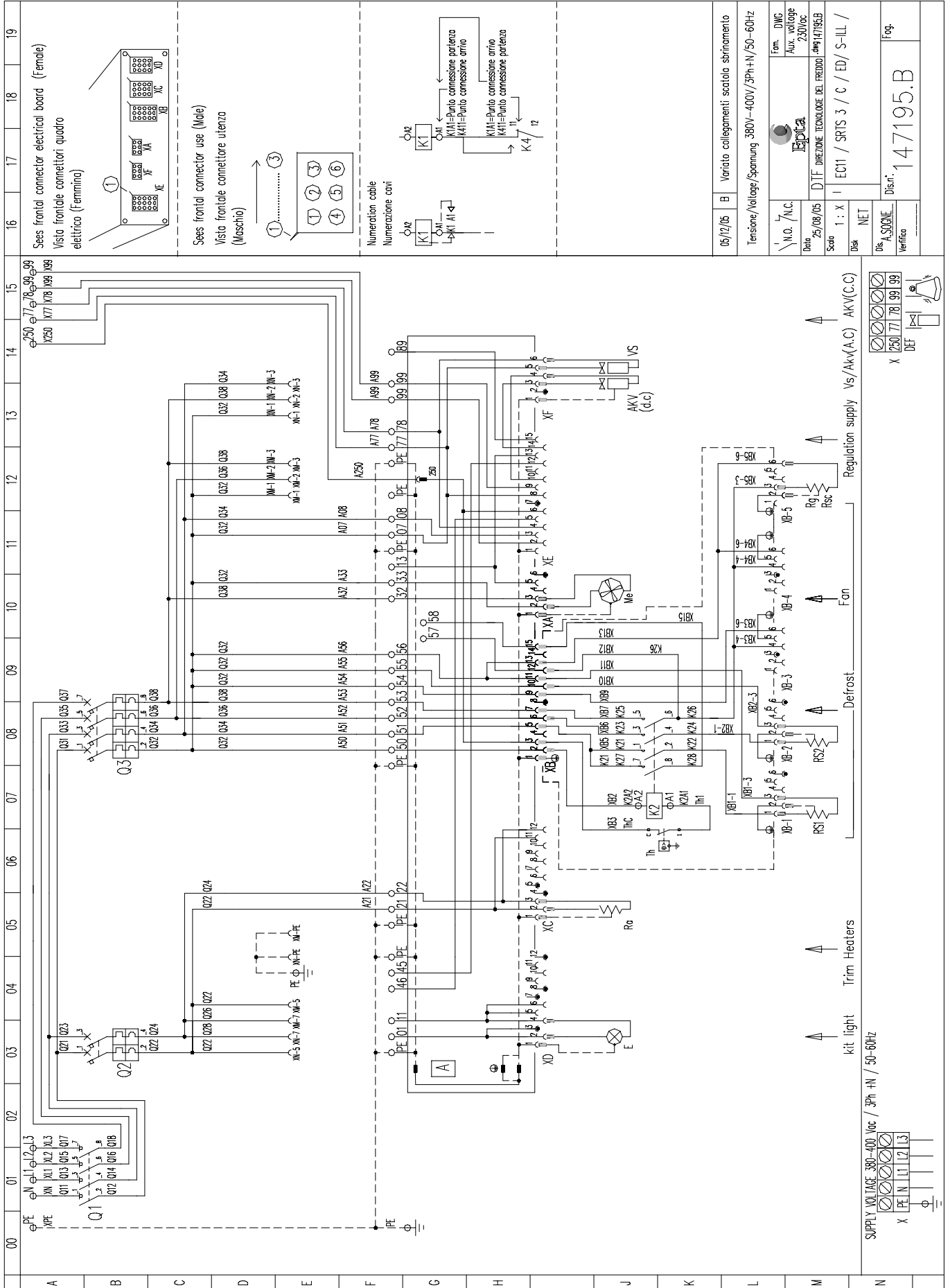
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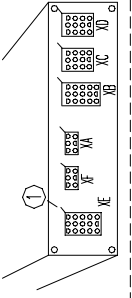
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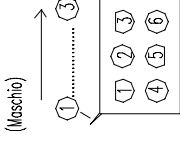
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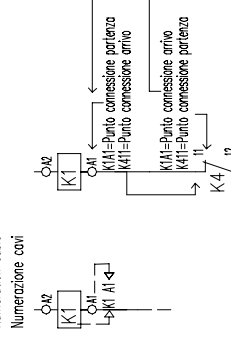
Sees frontal connector electrical board (Female)
 Vista frontale connettore elettrico (Femmina)



Sees frontal connector use (Male)
 Vista frontale connettore utenza (Maschio)



Numeration cable
 Numerazione cavi



05/12/05 B Variato collegamenti scatola sbrinatorio

Tensione/Voltage/Spannung 380V-400V/3Ph+N/50-60Hz

Form. DWG
 Aux. voltage
 230Voc

Dati: 25/08/05 DTF DIREZIONE TECNOLOGIE DEL FREDDO 099147195.B

Scala 1: X I ECH / SRTS 3 / C / ED/ S-ILL /

Dis. A.SOGNE Dis.n. 147195.B

Verifica Fog.

Regulation supply Vs/Ak(A,C) AK(V.C.C)

Fon

Deifrost

Trim Heaters

kit light

SUPPLY VOLTAGE 380-400 Voc / 3Ph +N / 50-60Hz

X PE N L1 L2 L3

X 250 77 78 99 99

DEF

X 250 77 78 99 99

DEF

X 250 77 78 99 99

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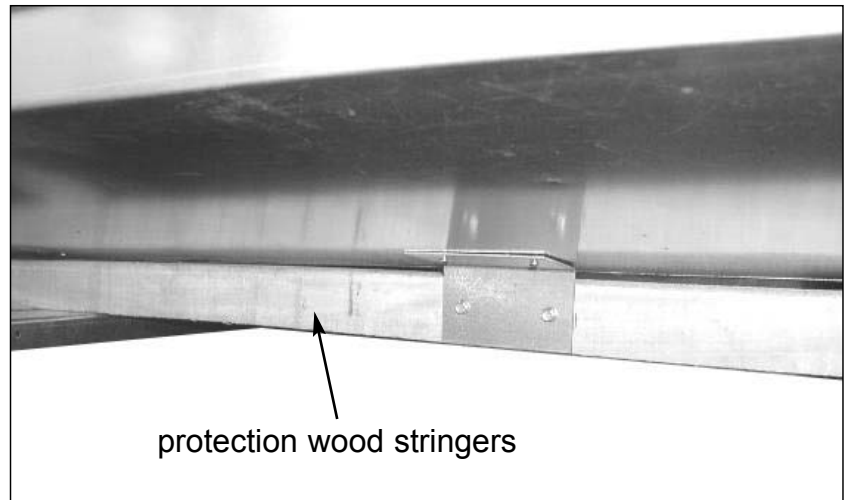
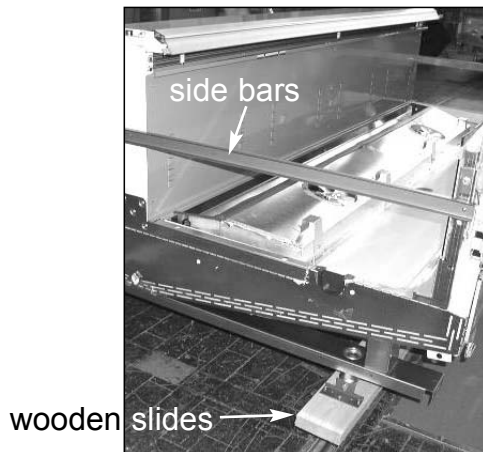
COSTAN TECHNICAL DOCUMENTATION	CHAPTER REVISION STATUS				SIGNED AS IN CONFORMITY WITH APPROVED ORIGINAL	PAGE: 1/6
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CABINET: LEOPARD	A	20.02.06	D		DATE of 1st ISSUE: 30.September.05	
CHAP. No. 10 DOC. N° QSM000259E	B	10.05.07	E			
CHAPTER: CABINET MULTIPLEXING	C		F			

MULTIPLEXING CABINETS

UNPACK THE CABINETS

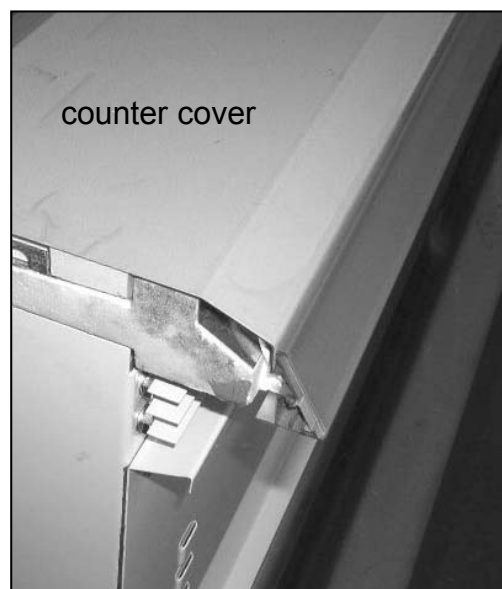
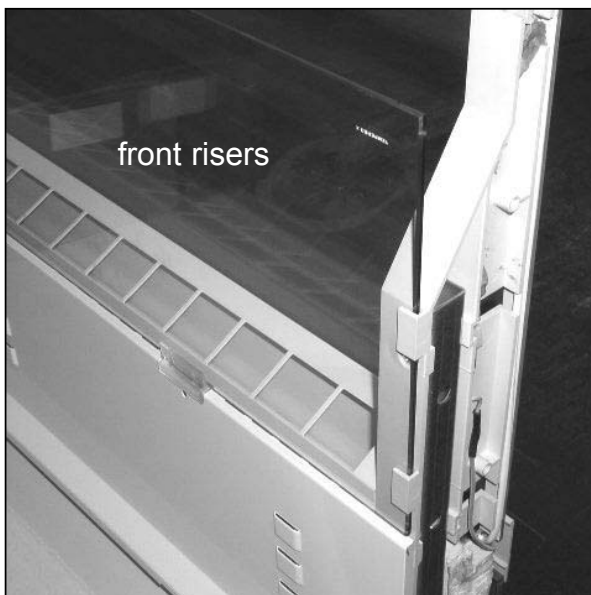
Remove the wooden slides and side bars that are meant to protect the cabinet during transportation. Remove the wood stringers located under the cabinet, which are meant to protect this during transportation (see photo).

Unpack the cabinets with the utmost care to avoid scratching or denting.



REMOVE FRONT RISERS, BOTTOM PLATES AND COUNTER COVER

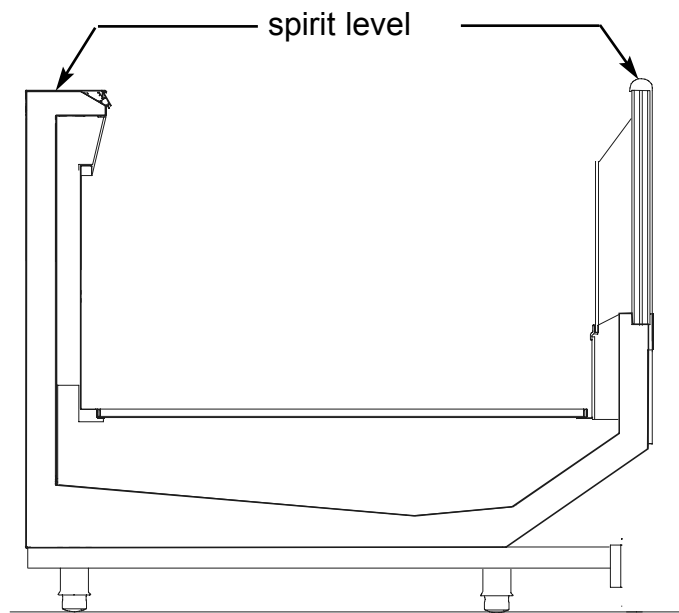
Remove front risers from the cabinet multiplexing side. Remove the bottom plates. Lift the counter cover off and remove it from the multiplexing side.



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CABINET: LEOPARD CHAP. No. 10 DOC. N° QSM000259E CHAPTER: CABINET MULTIPLEXING	A	20.02.06	D		DATE of 1st ISSUE: 30.September.05	
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	C		F			

PLACE THE FIRST CABINET

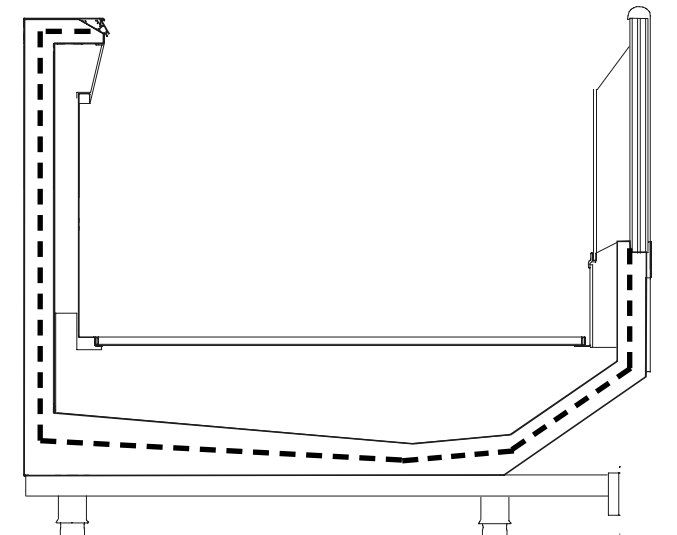
Bring the cabinet wherever this is to be installed. **When mutiplexing includes an end cabinet, position the end cabinet first. Check that it is level** both crossways and lengthwise by the use of a spirit level. Level the cabinet by applying a cylinder-section tool on the feet ($\varnothing = 8 \text{ mm}$). **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.

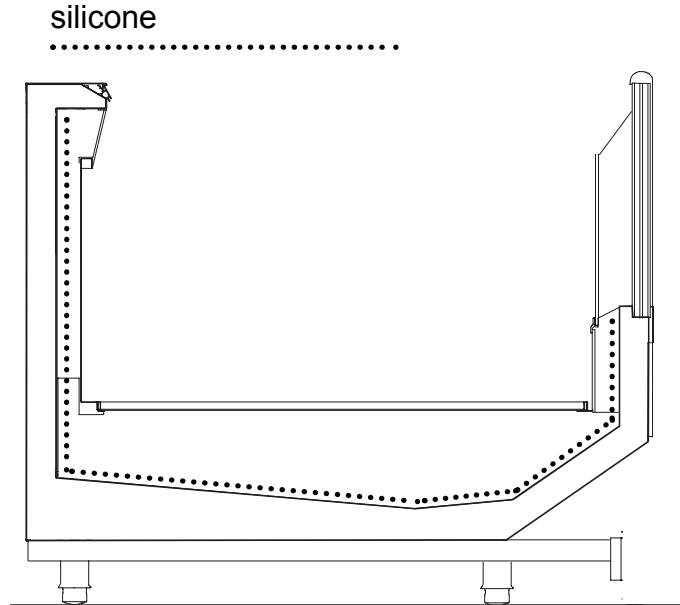
sponge rubber



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CABINET: LEOPARD	A	20.02.06	D		DATE of 1st ISSUE: 30.September.05	
CHAP. No. 10 DOC. N° QSM000259E	B	10.05.07	E			
CHAPTER: CABINET MULTIPLEXING	C		F			

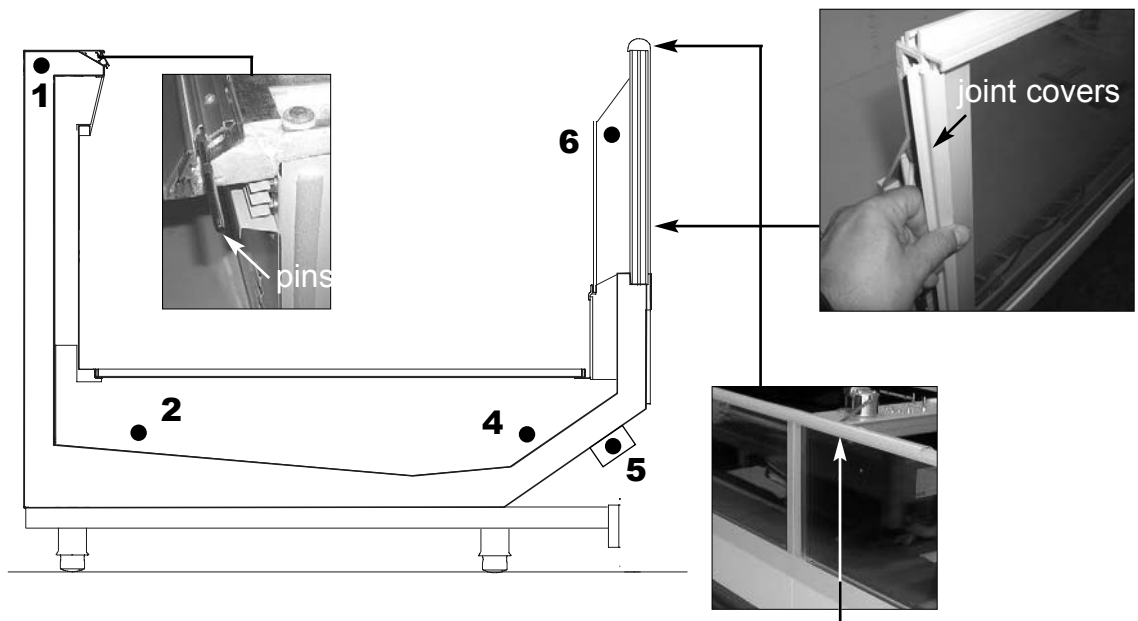
CAULK THE SIDE WITH SILICONE

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.

COSTAN TECHNICAL DOCUMENTATION	CHAPTER REVISION STATUS				SIGNED AS IN CONFORMITY WITH APPROVED ORIGINAL	PAGE : 4/6
	ORD.	DATE	ORD.	DATE		
CABINET: LEOPARD CHAP. No. 10 DOC. N° QSM000259E CHAPTER: CABINET MULTIPLEXING	A	20.02.06	D		DATE of 1st ISSUE: 30.September.05	
	B	10.05.07	E			
	C		F			

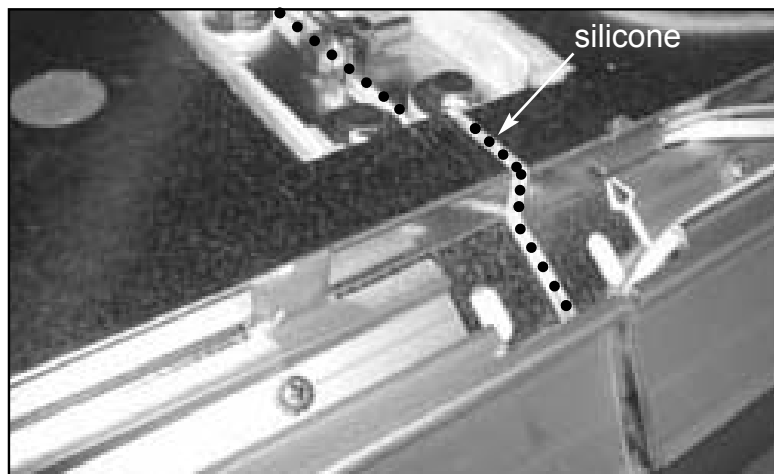
PLACE SCREW CAPS

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

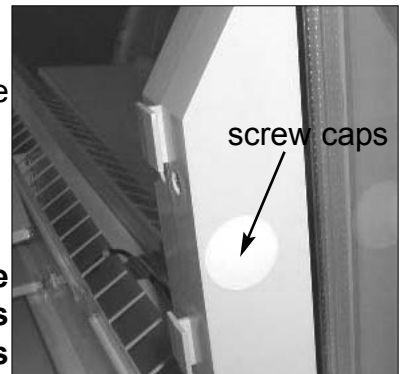
Apply a smooth seam of silicone in the joint between the counters.
Put the counter covers back in place and fix them with silicone.



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PLACE SCREW CAPS

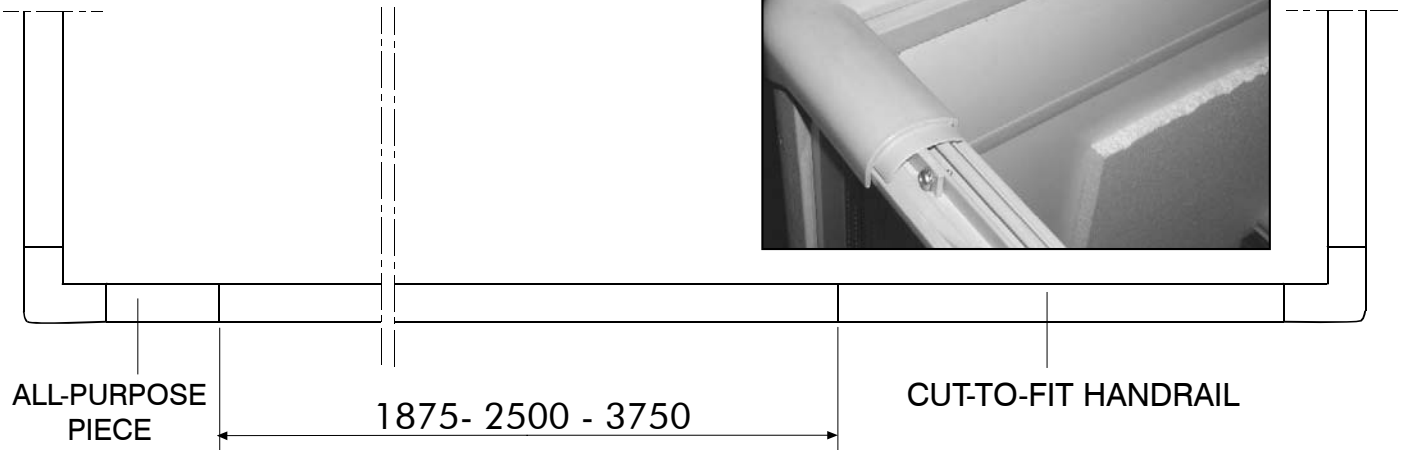
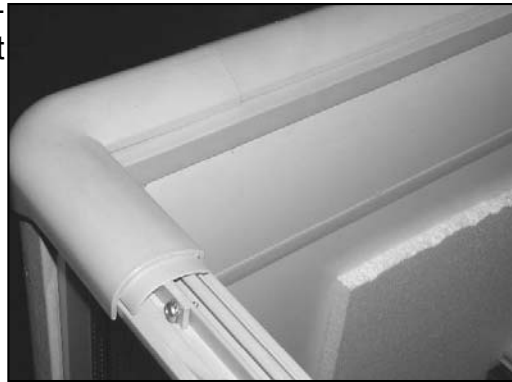
Once the cabinets have been multiplexed, place the screw caps on the screws on the well front.



INSTALL HANDRAILS

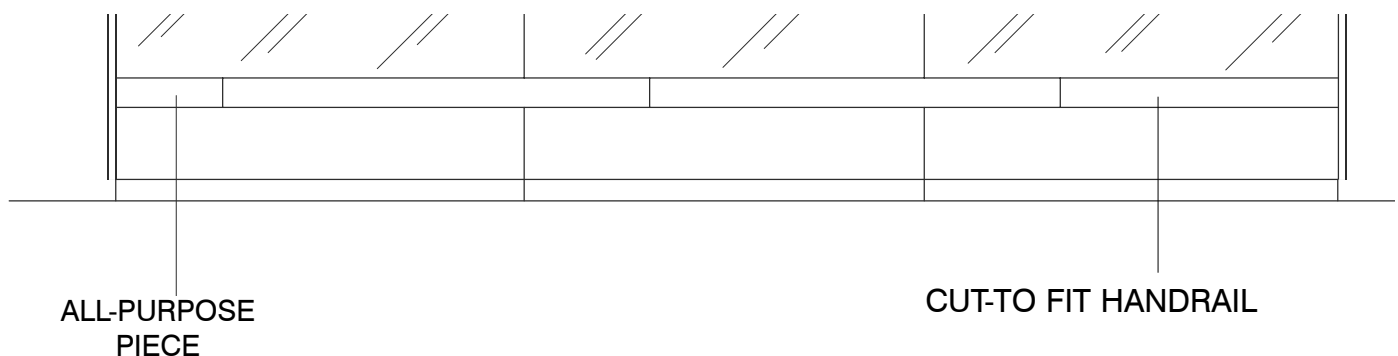
Side handrails and corner pieces are factory-assembled. **The side handrails of end cabinets are mounted on the cabinet instead. This is why it is necessary to remove them prior to executing the steps described below for the "all purpose" handrail piece.**

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

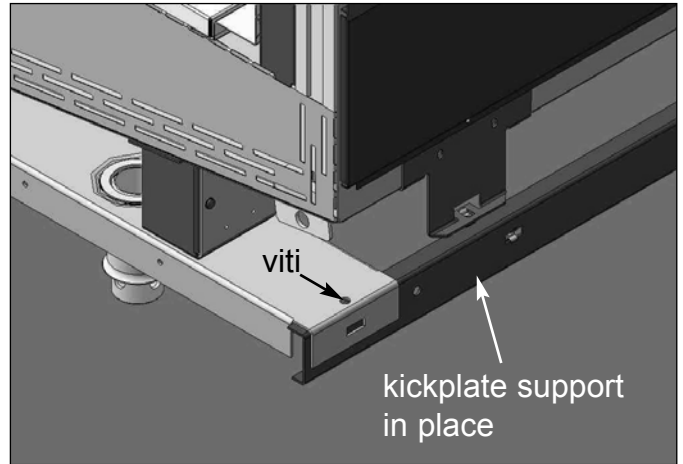
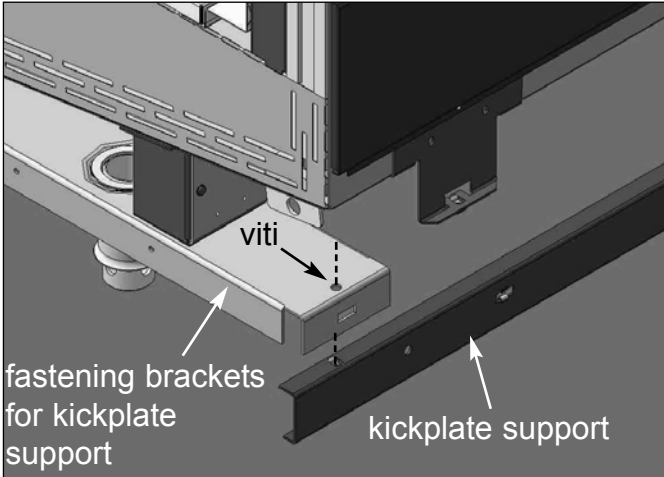
To enable a perfect alignment of the plastic bumper rails integral with the cabinet, an extra "all-purpose" piece, which is to be used to bring bumper rails back or forward. Mount the all-purpose handrail flush to one of the endwalls on the supports, and then all the others but the last likewise. Determine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



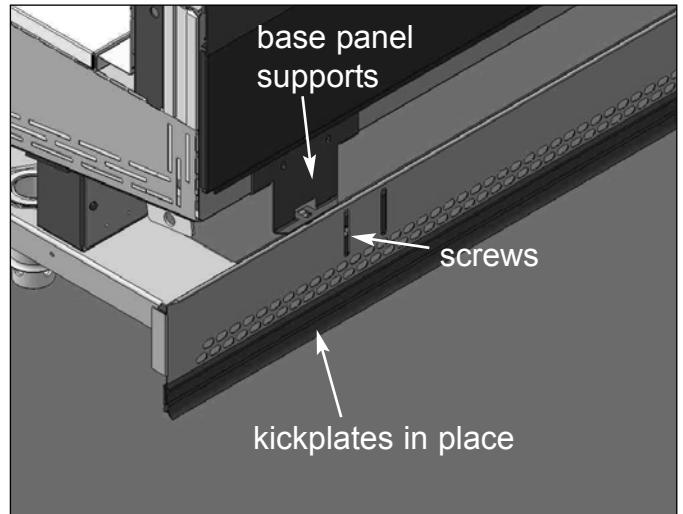
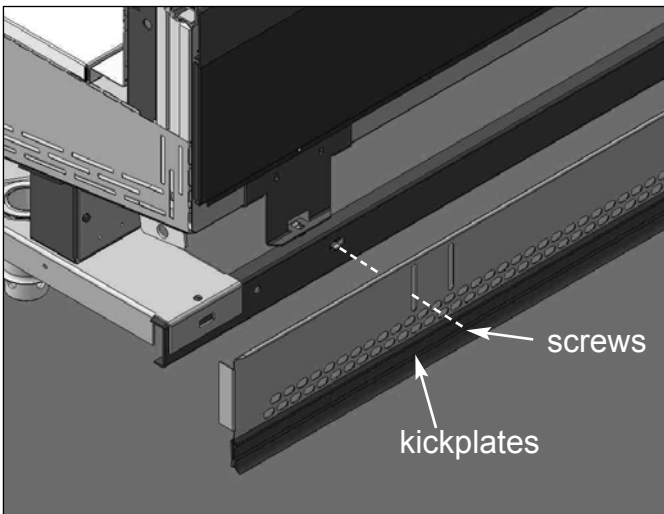
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PLACE THE BASE PANEL AND THE KICKPLATES

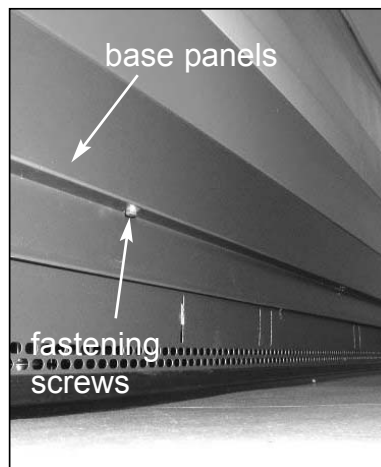
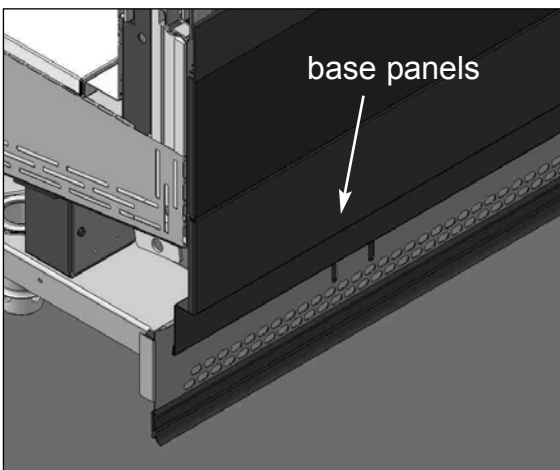
Place the kickplate support and screw it onto the appropriate supports using the screws attached, as shown in the figure.



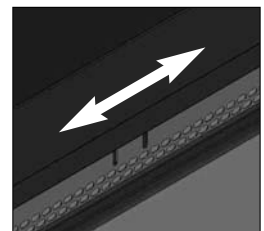
Place the kickplates onto the just installed supports by the screws supplied, as shown in the figures.



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 horizontally.



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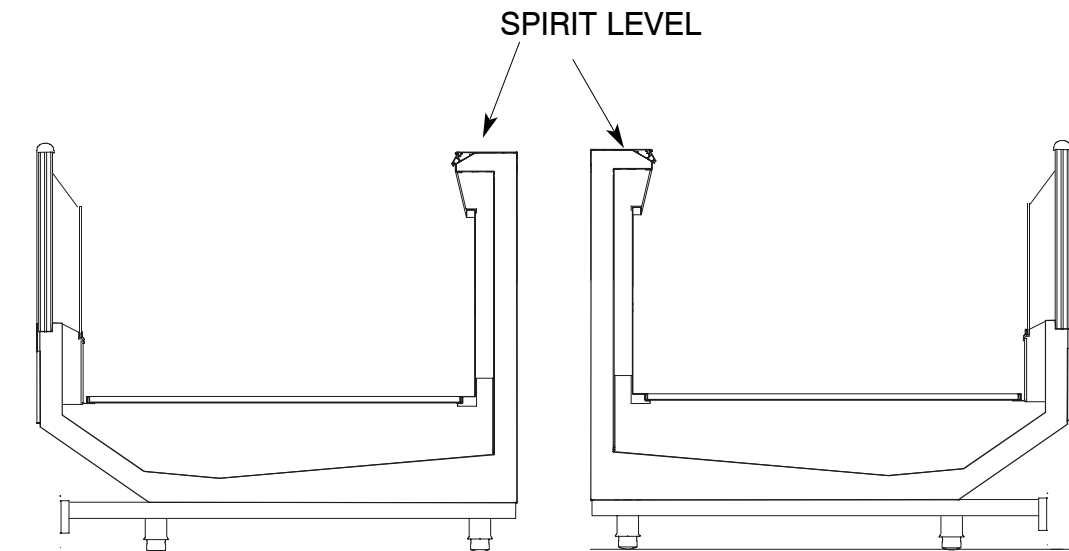
JOINING BACK-TO-BACK CABINETS WITH HEAD CABINETS

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

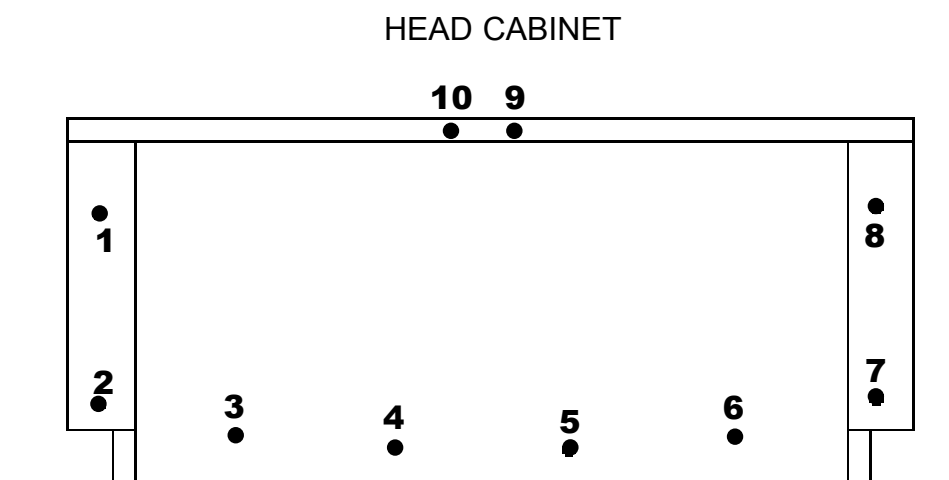
Apply sponge rubber and silicone as explained in the previous section. Then bring linear cabinets back to back in their service position.

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

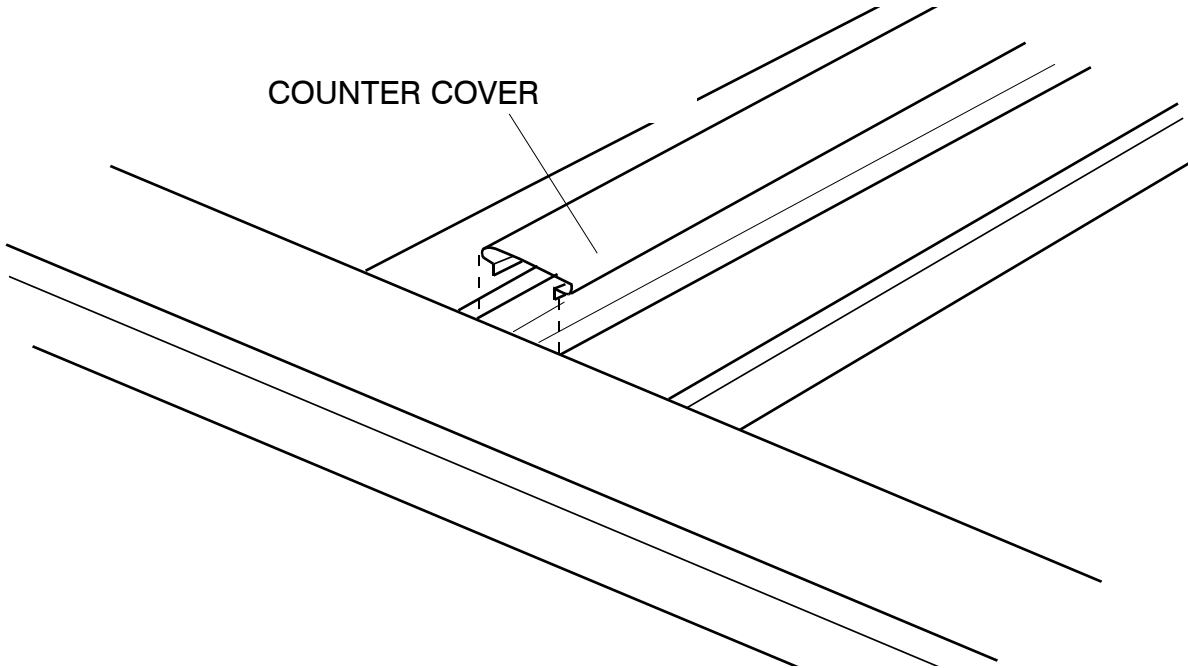
Bring the cabinets near each other and check their levelness. Then join them the points indicated in the figure using hex-head screws M8x90 and the appropriate nuts, and a self-screw on the points 9.10.



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INSTALL COUNTER CENTRE COVERS

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



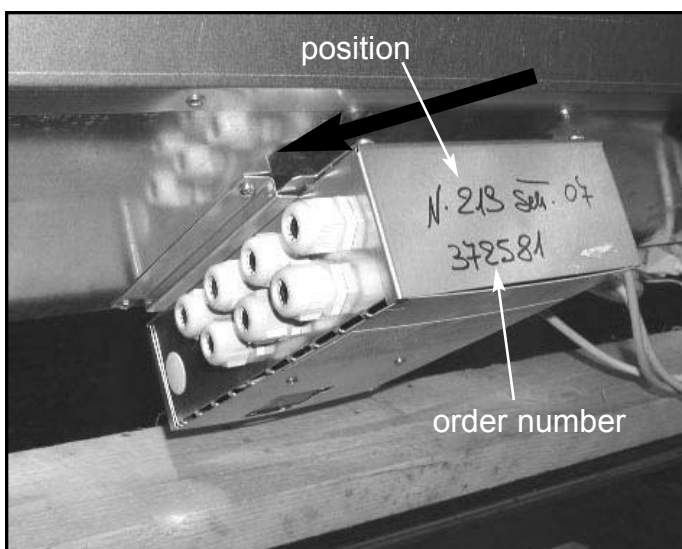
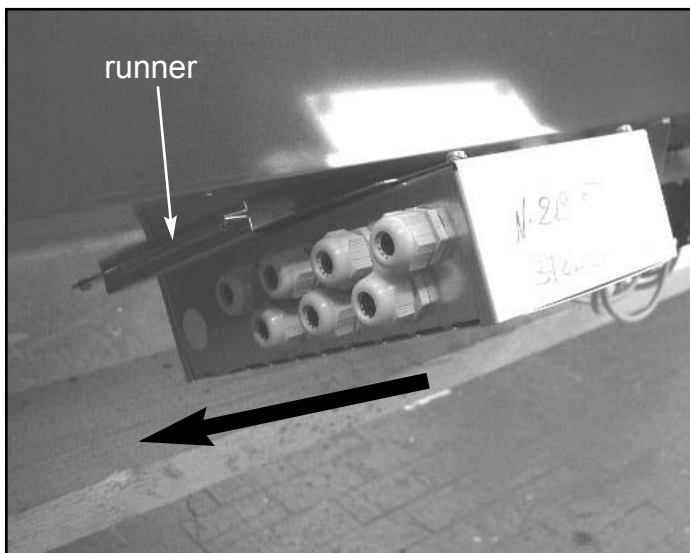
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INSTALLATION OF ELECTRIC BOARD

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.

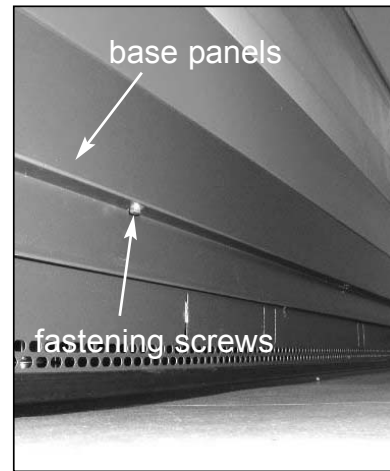
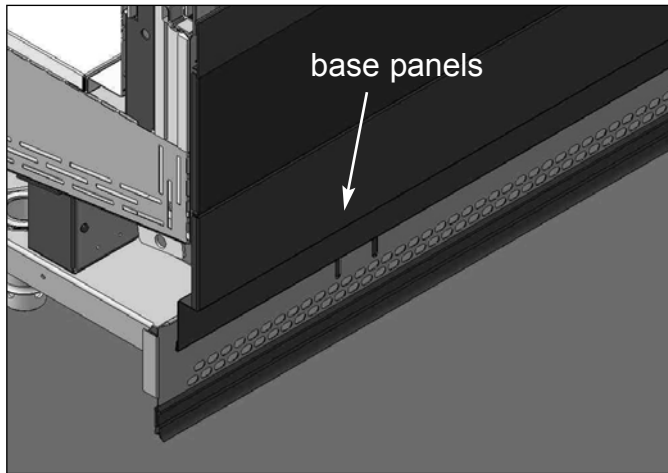


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EXTRACTION OF ELECTRIC BOARD

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.



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CHAPTER: INSTALLATION OF PLEXIGLASS DIVIDERS						

INSTALLATION OF PLEXIGLASS 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

MASTER/SLAVE

TERMINAL BOARD

MASTER 2 (2EV)

1 CABINET

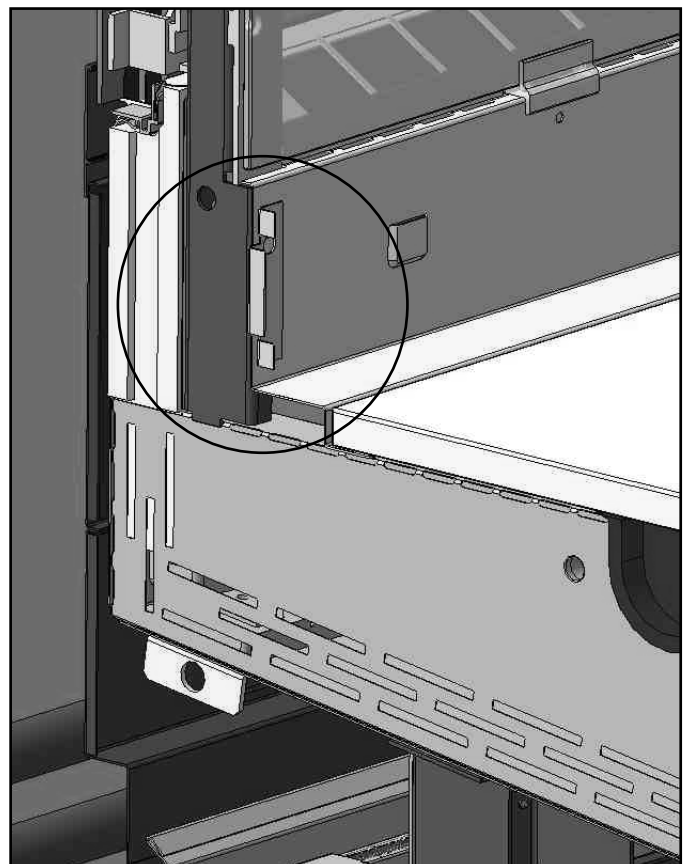
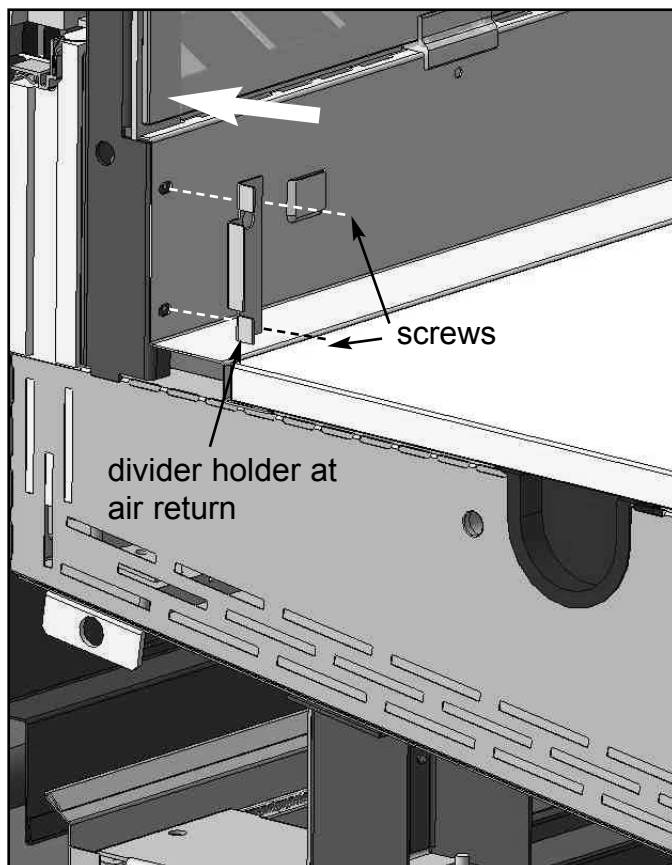
1-2-3 CABINETS

1-2-3 CABINETS

1 or 2 CABINETS

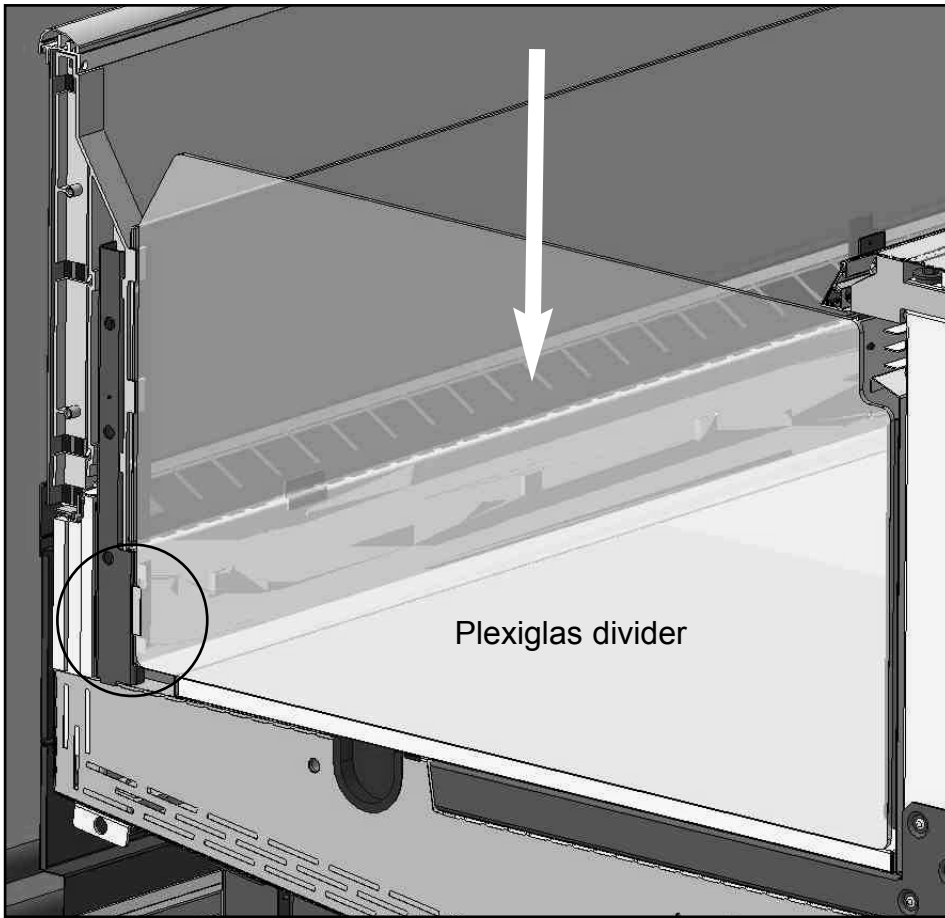
Technical Plexiglas dividers are not required between straight cabinets and head cabinets.

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

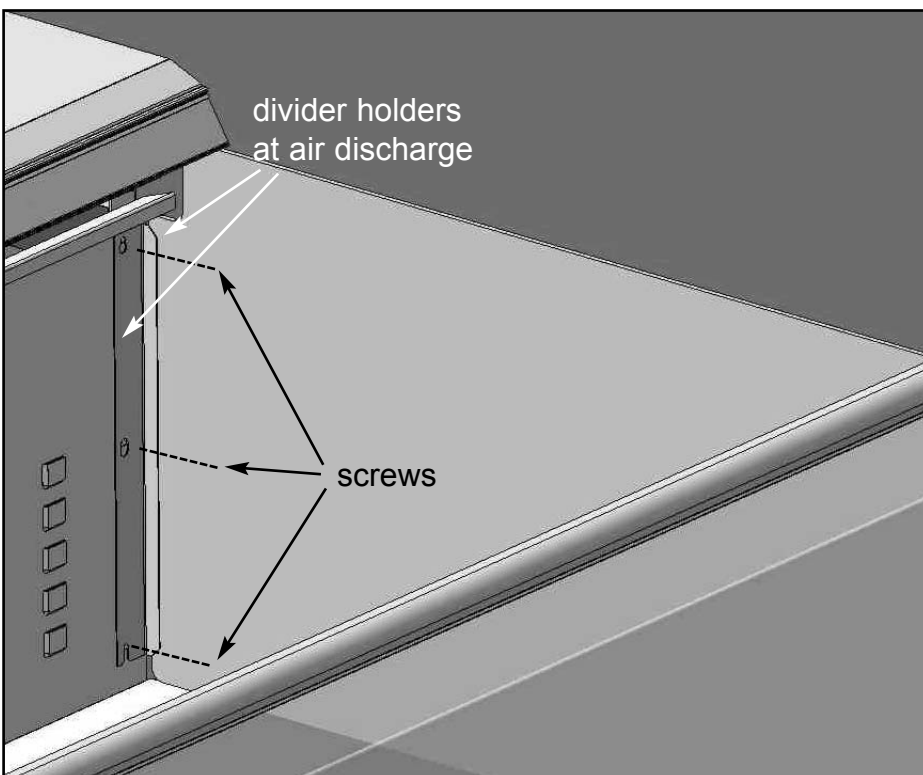


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Slide Plexiglas dividers into the just-installed holders.



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.**



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ASSEMBLY OF OPTIONAL STAINLESS-STEEL BUMPER RAIL

Place the stringer in the holding stirrups.

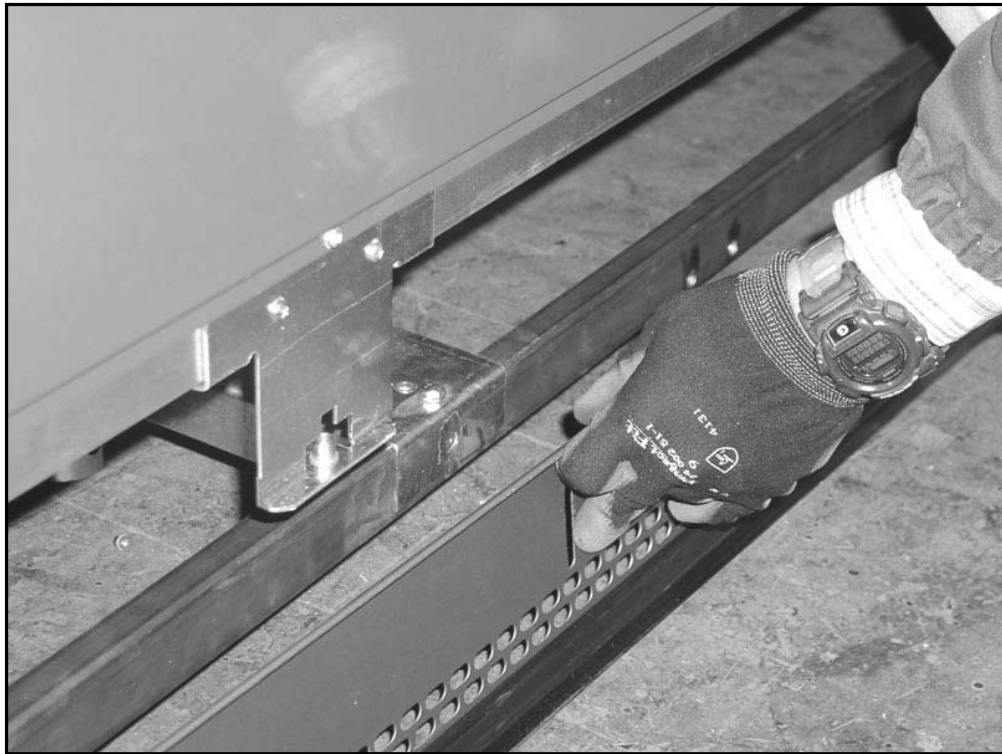


Fasten the stringers to the stirrups using the attached hex-head screws M6X30+washers.



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Lean the kick plates onto the just assembled stringers.

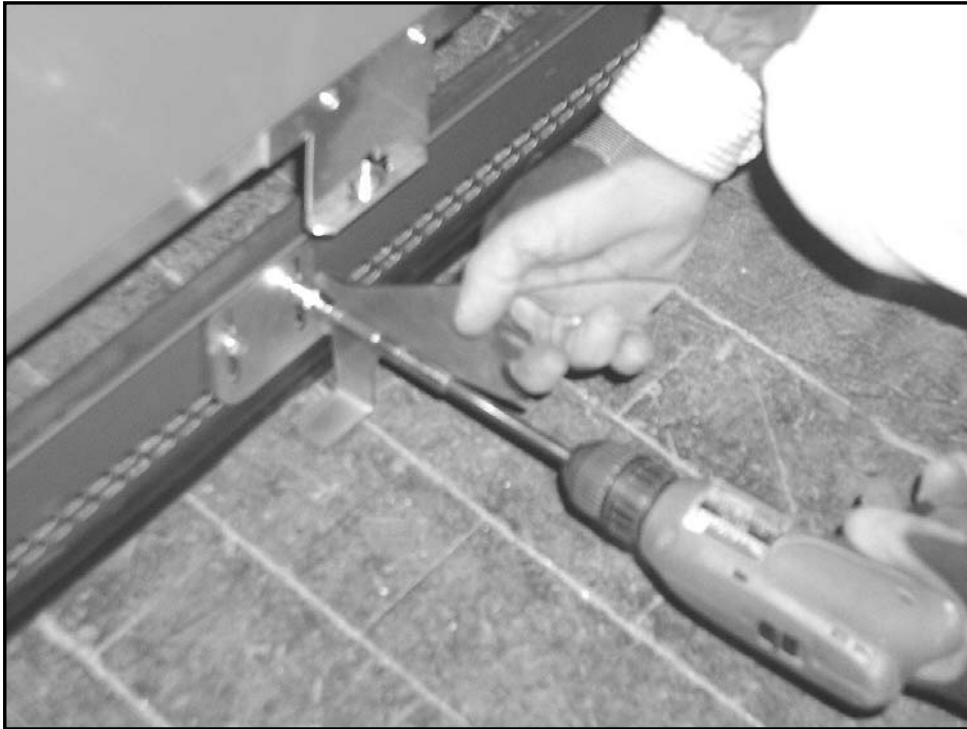


Place the bumper rail supports using the slots on the stringer and the slots on the bumper rail.



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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.

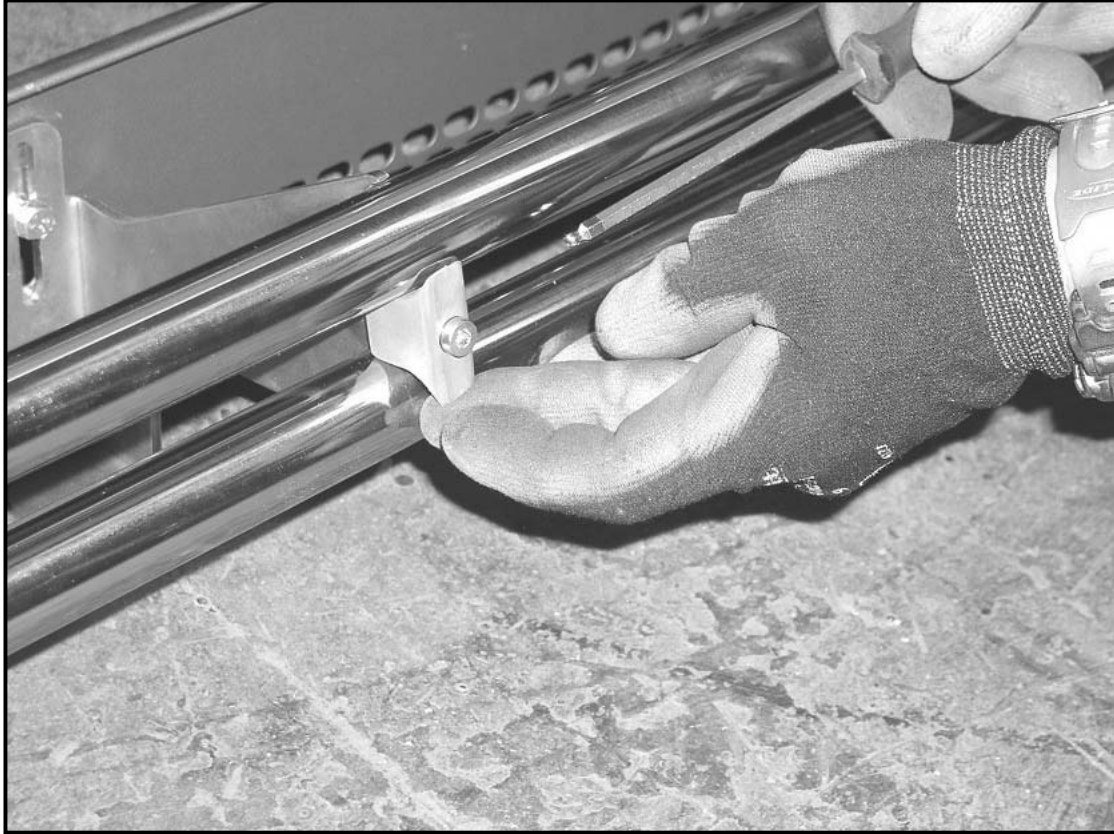


Place tubular stainless-steel bumper rails on their supports and the bumper rails with bends using the appropriate plastic joints.



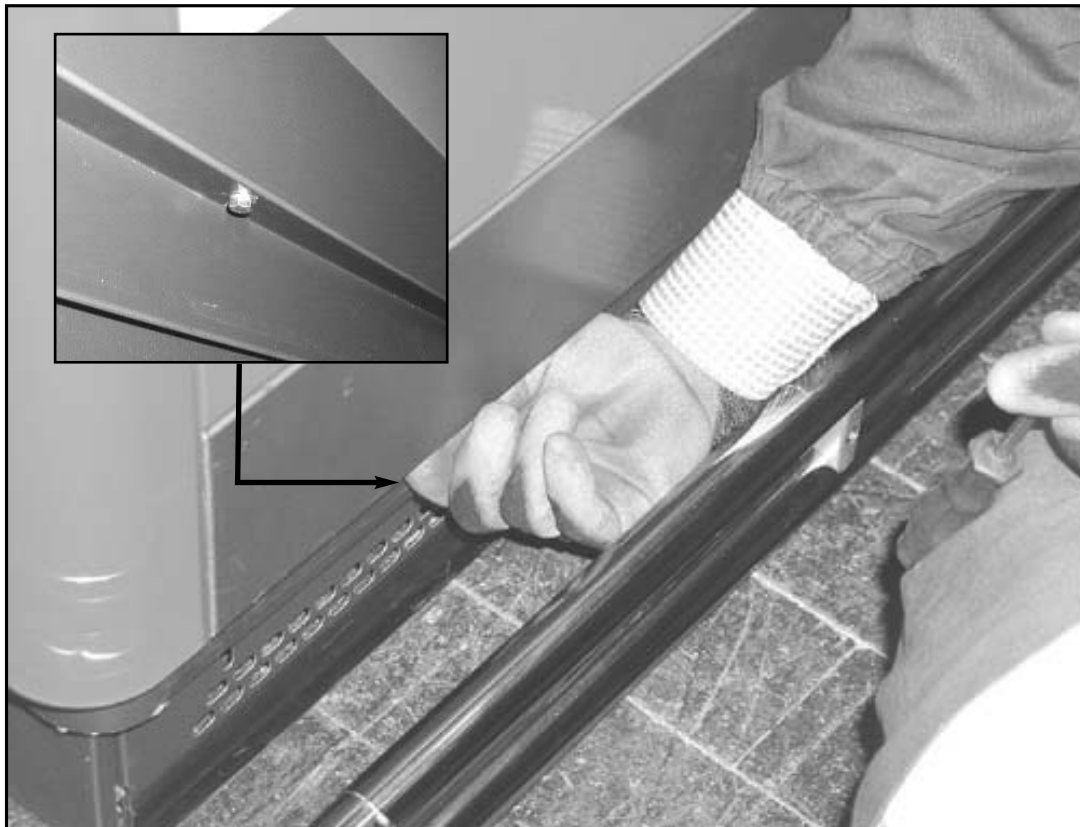
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Place and fasten the attached tubular bumper rail stop blocks using the Allen screw.



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



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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).

