building climate technology

Technical manual EN

MARK TANNER MDA+

0662535_R02

READ THIS DOCUMENT BEFORE INSTALLING THE HEATER

Warning
Incorrect installation, adjustment, alteration, repair or maintenance work may lead to material damage or injury. All work must be carried out by certified, qualified professionals. If the appliance is not positioned in accordance with the instructions, the warranty shall be rendered void. This appliance is not intended for use by children or persons with a physical, sensory or mental handicap, or who lack the required experience or expertise, unless they are supervised or have been instructed in the use of the appliance by somebody who is responsible for their safety. Children must be supervised to ensure that they do not play with the appliance.

EN

1 General

1.1 Application

Appliance type MDA+ is solely suitable for the free and direct intake of the air to be heated and the free discharge of heated air into the room. If areas are to be heated in which corrosive vapours are present (chlorinated hydrocarbons in particular), which are either produced directly in the area, or which may be drawn in from the outside by the heater via a duct or an open connection, wall air heaters cannot be used because of the risk of corrosion to the heat exchanger.

Subject to change

The manufacturer is committed to constantly improving its products and reserves the right to make changes in the specifications without prior notice. The technical details are considered correct but do not form the basis for a contract or warranty. All orders are accepted according to the standard terms of our general sales and delivery conditions (available upon request). The information in this document is subject to change without notice. The most recent version of this manual is always available at **www.markclimate.com/downloads.**

1.2 General warnings

Incorrect installation, adjustment, alteration, maintenance or repair of the MDA+ may lead to material or environmental damage and/or injuries. The appliance should therefore be installed, adapted or converted by a qualified and certified installer, taking into account national and international regulations. Faulty installation, adjustment, alteration, maintenance activity or repair shall render the warranty void.

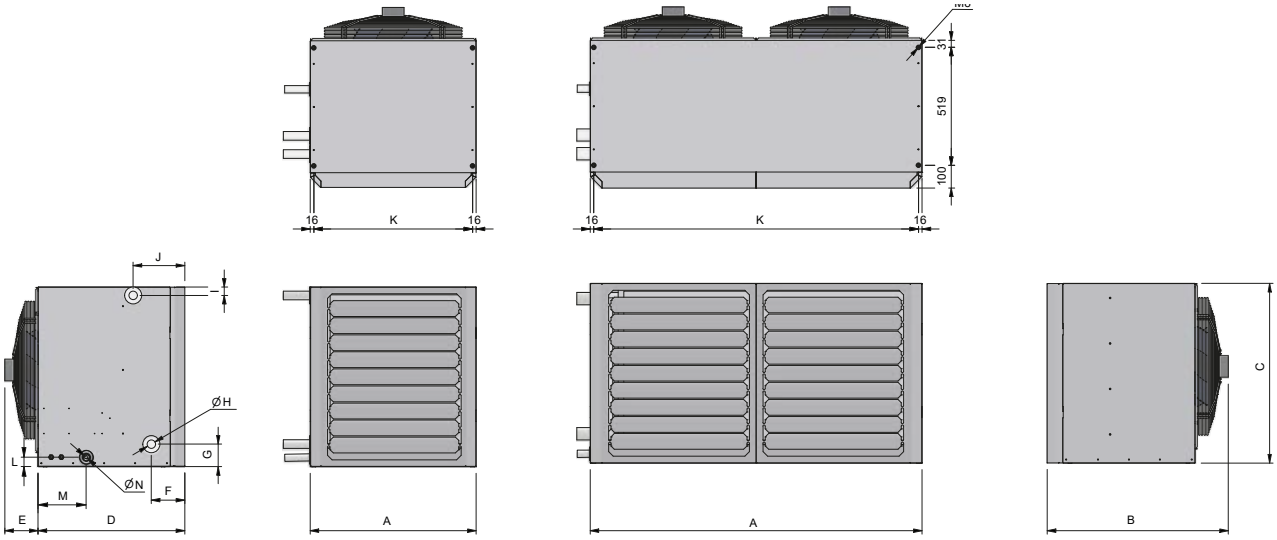
2 Technical specifications

2.1 Technical specifications

Type			241	341	441	541
Weight without accessoires		kg	42	62	82	119
Air flow	max	m³/h	3734	5423	8217	10600
Horizontal Throw		m	12	19	27	22
Noise at 5 m	max	dB(A)	55	53	59	56
Consumed current		A	2,2	1,7	2,7	3,4
Nominal electric power		kW	0,32	0,24	0,62	0,76
Speed	max	rpm	1400	950	1000	950

Refer to Chapter 6 for the performance charts of the MDA+.

2.2 Dimensions



Type	A	B*	C	D	E*	F	G	H	I	J	K	L	M	N**
200	580	774	640	650	128	137	97	1”	33	217	548	41	213	32
300	730	794	790	650	144	147	99	1 1/2”	37	227	698	41	213	32
400	860	805	920	650	155	152	101	1 1/2”	39	232	828	41	213	32
500	1460	794	790	650	144	151	129	2”	67	233	1428	41	213	32

* These dimensions are based on EC fans. Other fans may differ from these dimensions.
** An MDA+ with natural slope has a drain with a diameter of 32mm. An MDA+ with optional condensate pump has a 4.5 meter long PVC pipe DN 10.

3 Unit Placement and Installation

3.1 Positioning the appliance

After unpacking, check the appliance for damage. Check that the information relating to the type/model and the electrical voltage is correct. Place the appliance and any accessories to a sufficiently solid structure, taking into account the minimum free space required.

3.2 Installation

3.2.1 Placement considerations

Placement of indoor units should take account of the following considerations:

» MDA+ units must not be installed with vertical air discharge.
» MDA+ units should not be installed in positions where dust or dirt may affect heat exchangers.
» MDA+ units should not be installed in locations where exposure to oil or to corrosive or harmful gases, such as acidic or alkaline gases, may occur.
» MDA+ units should not be installed in locations where exposure to salinity may occur unless the anti-corrosion treatment for high-salinity areas is added.
» Sufficient space for drain piping and for access during servicing and maintenance should be allowed.
» To ensure a good cooling/heating effect, short-circuit ventilation (where outlet air returns quickly to a unit's air inlet) should be avoided.
» In case the unit is used for cooling, a condensate drain should be added. A condensate drain should fulfil the local and national regulations. Optional is the use of a integrated condensatepump.
» There should be a water lock with a height of at least 50mm integrated at the unit

EN

3.2.2 Spacing

Indoor units must be spaced such that sufficient air may flow through each unit. Sufficient airflow across heat exchangers is essential for indoor units to function properly. Figures 3.1 and 3.2 show spacing and placement requirements.

Figure 3.1 Side view

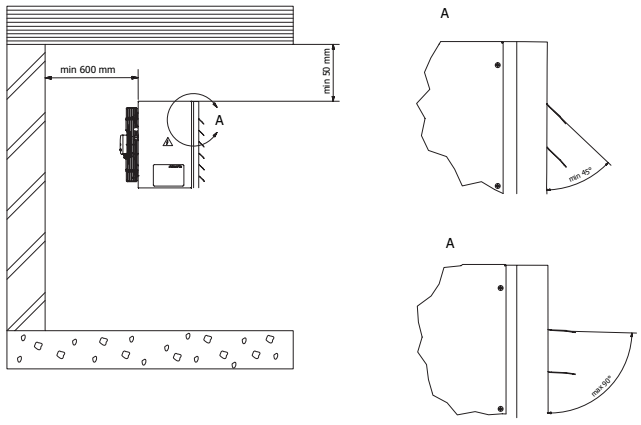
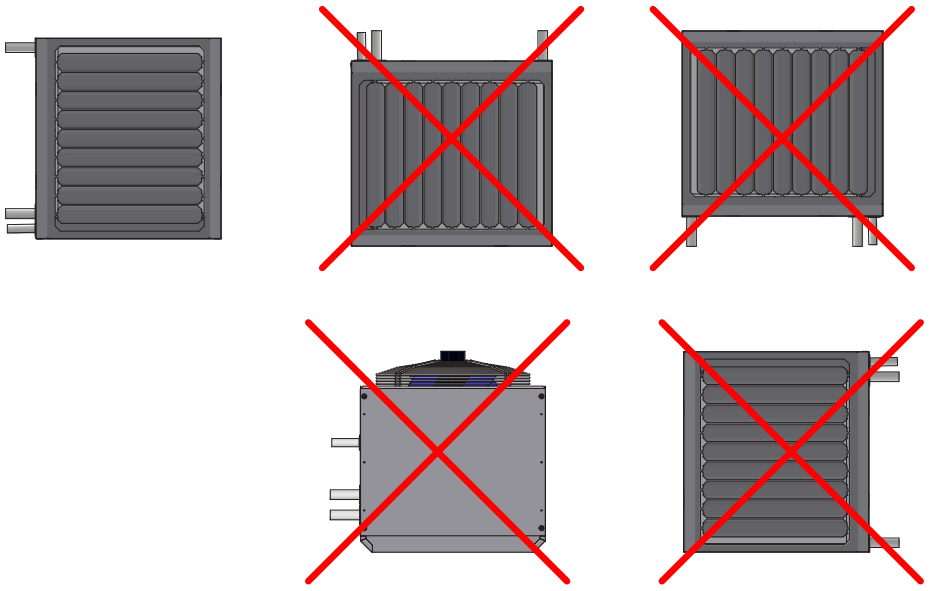


Figure 3.2 Front view



3.2.3 Hoisting

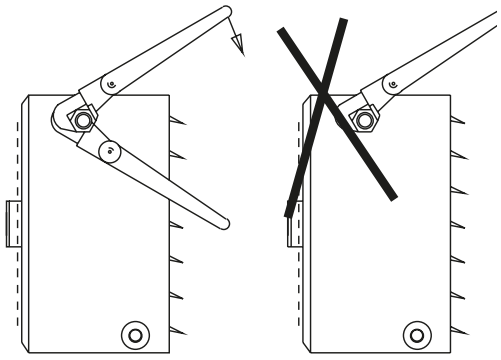
» Do not remove any packaging before hoisting. If units are not packaged or if the packaging is damaged, use suitable boards or packing material to protect the units.
» Hoist one unit at a time, using two ropes to ensure stability.
» Keep units upright during hoisting, ensuring that the angle to the vertical does not exceed 30°.

3.2.4 General

» When connecting the heater onto the mains use an additional pipe wrench to avoid twisting the pipe.

Max. operating pressure	14 Bar
Max. water temp.	120 Celsius

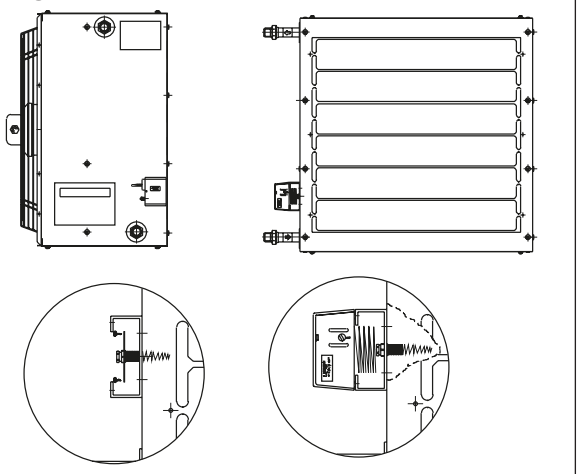
Figure 3.4



3.2.7 Frost protection

» Because under certain circumstances (outside air colder than 5 degrees) there is a risk of the heater freezing up, protection against freezing must be installed to prevent this from happening.

Figure 3.5



EN

3.3 Controller

In operation cooling the speed of the axial fan must be reduced to avoid condensate waterdrops are taken with the airflow. The level of reduction depends to the local circumstances. The default setting of fan speed reduction is 70% of its normal speed. In case of AC axial fans this should be managed manual, e.g. with a 5-step transformer. In case of EC, the 0-10V signal should be reduced to 7 VDC (default setting).

Advised is to apply the PinTherm Mistral controller, reduction of the airflow in case of Cooling is integrated.

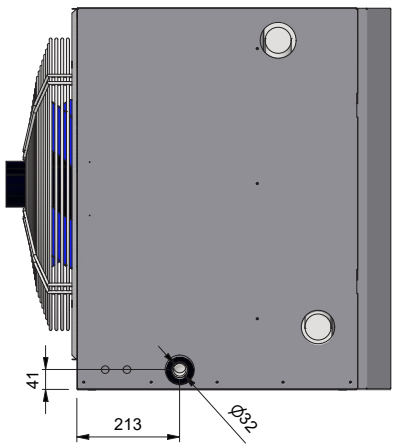
3.4 Instruction optional condensate

3.4.1 Condensate drain without pump

In case there is a condensate drain natural flow in the MDA+. The pipe to drain the condensed water must be connected to the MDA+ as shown in Figure 3.6.

To allow smooth condensate drainage and to ensure unit stability (to prevent excessive noise or vibration), ensure that units are level wo within 1° of the horizontal. If a unit is not level to within 1° of the horizontal, water leakage or abnormal vibration/noise may occur.

Figure 3.6 Condensate drain without pump

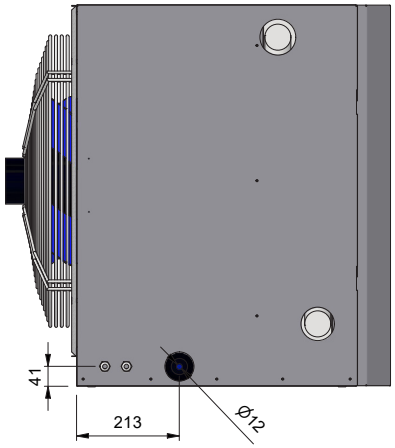


3.4.2 Condensate drain with condensate pump

If there is a condensate drain pump in the MDA+, then the pipe to drain the condensed water must be connected to the MDA+. As shown in the image below.

The condensate pump used in the MDA+ is the Si-83 from Sauermann

Figure 3.7 Condensate drain with pump

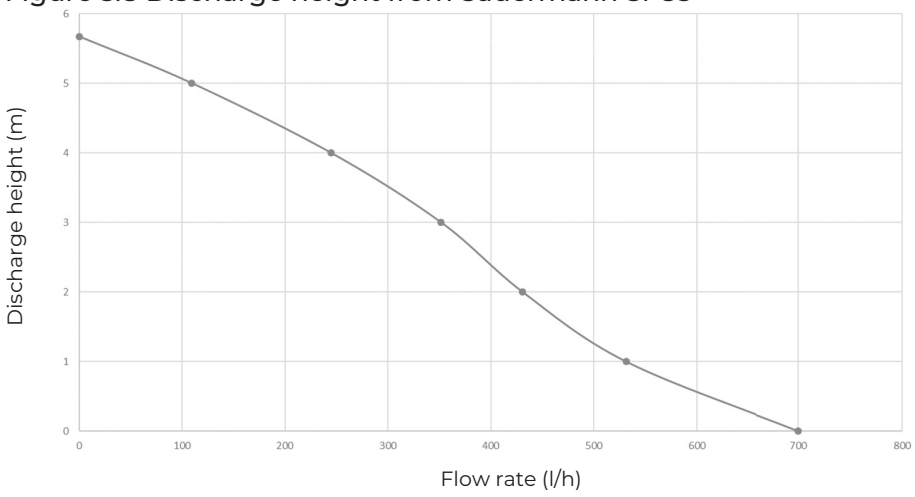


Type	Condensate amount[1]
MDA+ 14x	2 kg/h
MDA+ 24x	2 kg/h
MDA+ 34x	6 kg/h
MDA+ 44x	9 kg/h
MDA+ 54x	16 kg/h

[1] Indoor air temperature 27°C and 50% humidity

* Water temperature 7 - 12 C°

Figure 3.8 Discharge height from Sauermann Si-83



4.0 Maintenance

4.1 Instruction cleaning

Depending at your local circumstances, normally once a year the MDA+ has to be cleaned. So it can perform better. It is not allowed to use agressive cleaning products or a high pressure sprayer.

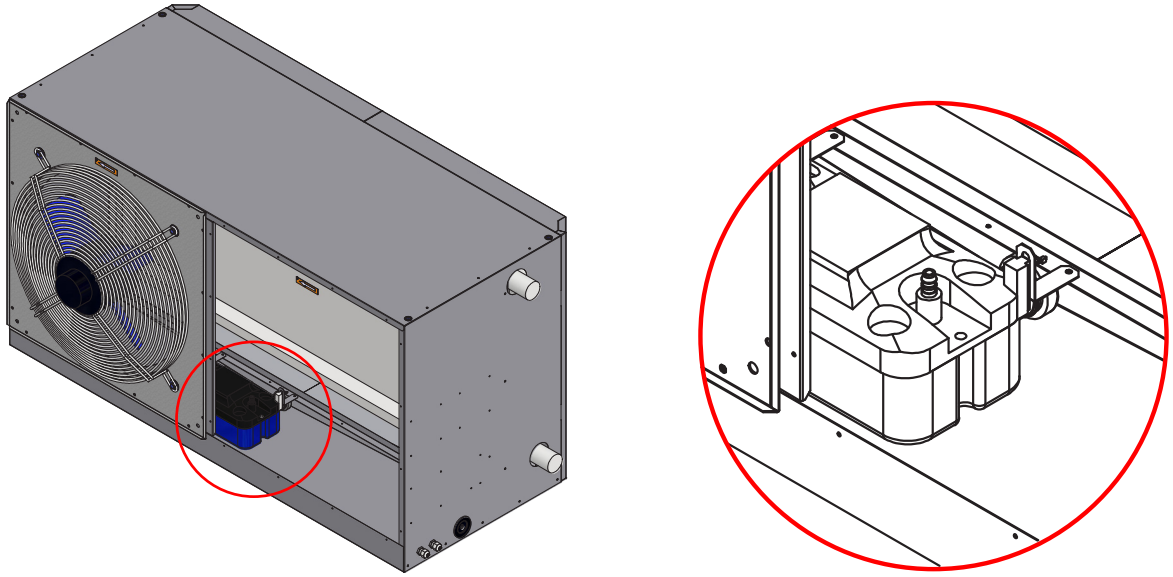
4.2 Replacing a broken condensate pump

EN

When the condensate drain pump breaks down, it must be replaced according the steps below. The location of the pump is shown in the figure.

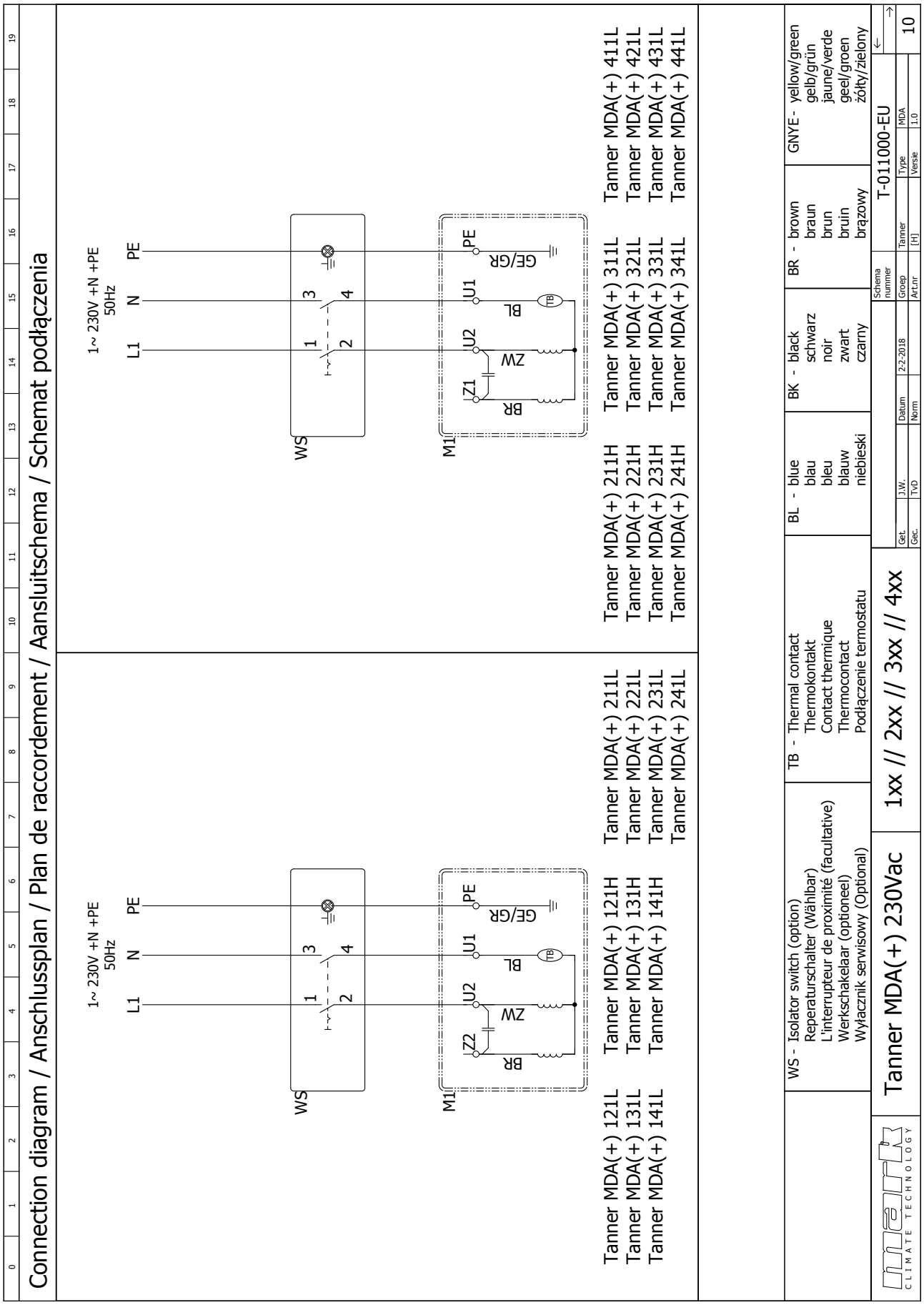
1. Disassemble the fan on the control side of the unit.
2. Disconnect the control- and power cable.
3. Unscrew the mounting bolts.
4. Replace the broken condensate pump with a new one.
5. Tighten the mounting bolts again.
6. Reconnect the control- and power cable.
7. Mount the fan back onto the MDA+

Figure 4.1 Replacing a broken condensate pump



5.0 Electrical diagrams

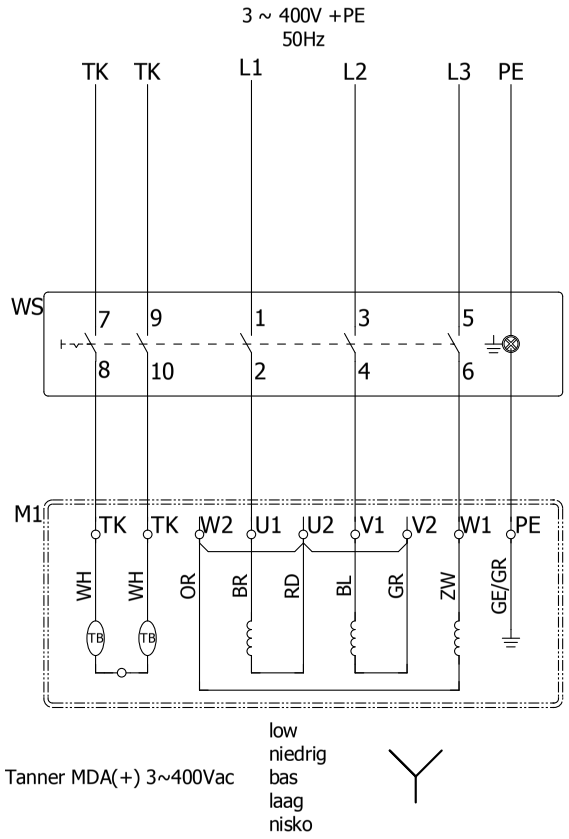
5.1 Connection diagram for Tanner MDA+ 241 / 341 / 441 230Vac

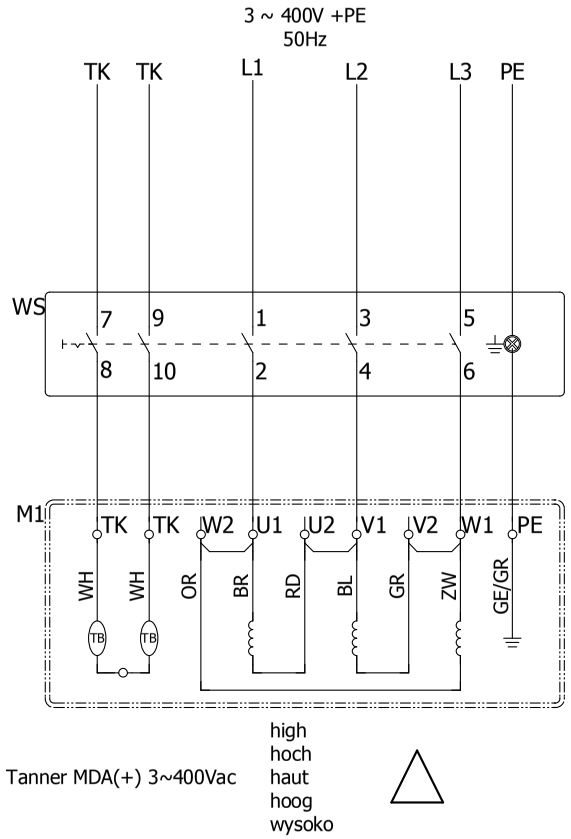


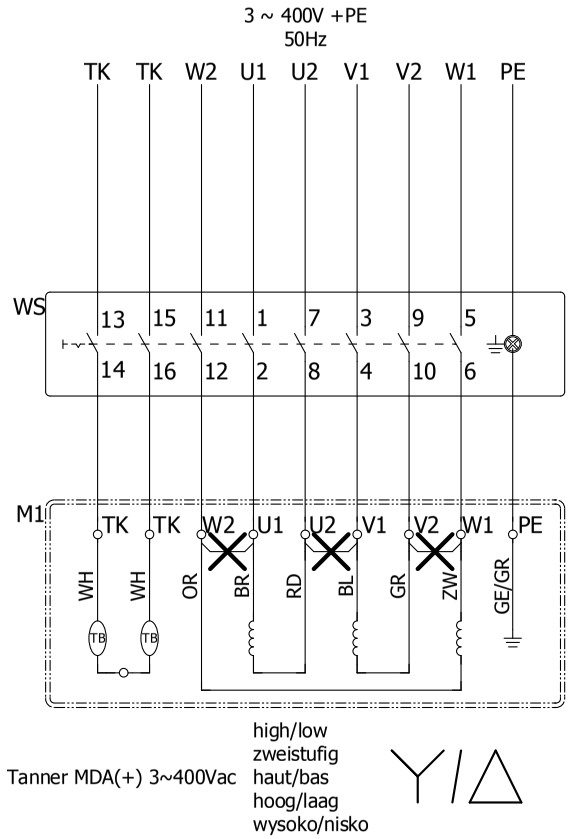
L = Lead | N = Zero | PE = Earth

L = Lead | N = Zero | PE = Earth

Connection diagram / Anschlussplan / Plan de raccordement / Aansluitschema / Schemat podłączenia







WS - Isolator switch (option)
Reperaturschalter (Wählbar)
L'interrupteur de proximité (facultative)
Werkschakelaar (optioneel)
Wyłacznik serwisowy (Optional)

By changing L1 andL2 you can change the rotation direction
Mittels Umtauschen L1 und L2 kann man die Drehrichtung ändern
En inversant L1 et L2, on change la direction de rotation
Door het verwisselen van L1 en L2, verandert de draairichting
Poprzez zmianę zasilania L1 i L2 można zmienić kierunek rotacji

Remove connection inside motor !!!
Brücke im Motor entfernen !!!
Éliminer les connexions en transfert dans le moteur !!!
Doorverbinding in de motor verwijderen !!!
Usuń połączenie wewnątrz silnika !!!

TK - Thermal contact Thermokontakt Contact thermique Thermocontact Podłączenie termostatu	BL - blue blau bleu blauw niebieski	BK - black schwarz noir zwart czarny	BR - brown braun brun bruin brązowy	GR - grey grau gris grijs szary	OR - orange orange orange oranje pomarańczowy	RD - red rot rouge rood czerwony	WH - white weiß blanc wit biały	GNYE - yellow/green gelb/grün jaune/verde geel/groen żółty/zielony

mark CLIMATE TECHNOLOGY

Tanner MDA(+) 400Vac

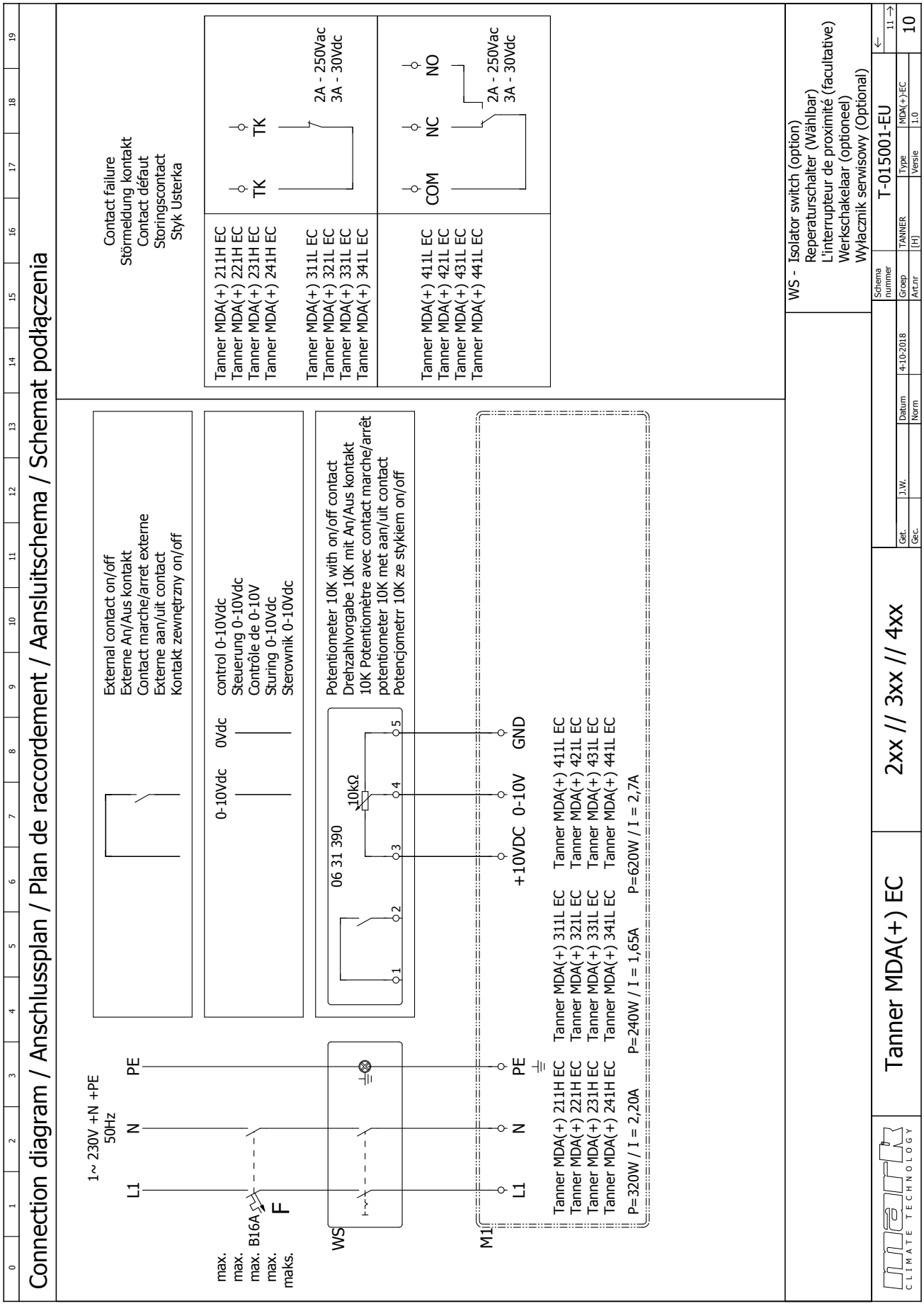
1xx // 2xx // 3xx // 4xx

				Schema nummer	T-012000-EU		
Get.	J.W.	Datum	2-2-2018	Groep	Tanner	Type	MDA
Gec.	TvD	Norm		Art.nr	[H]	Versie	1.0

10

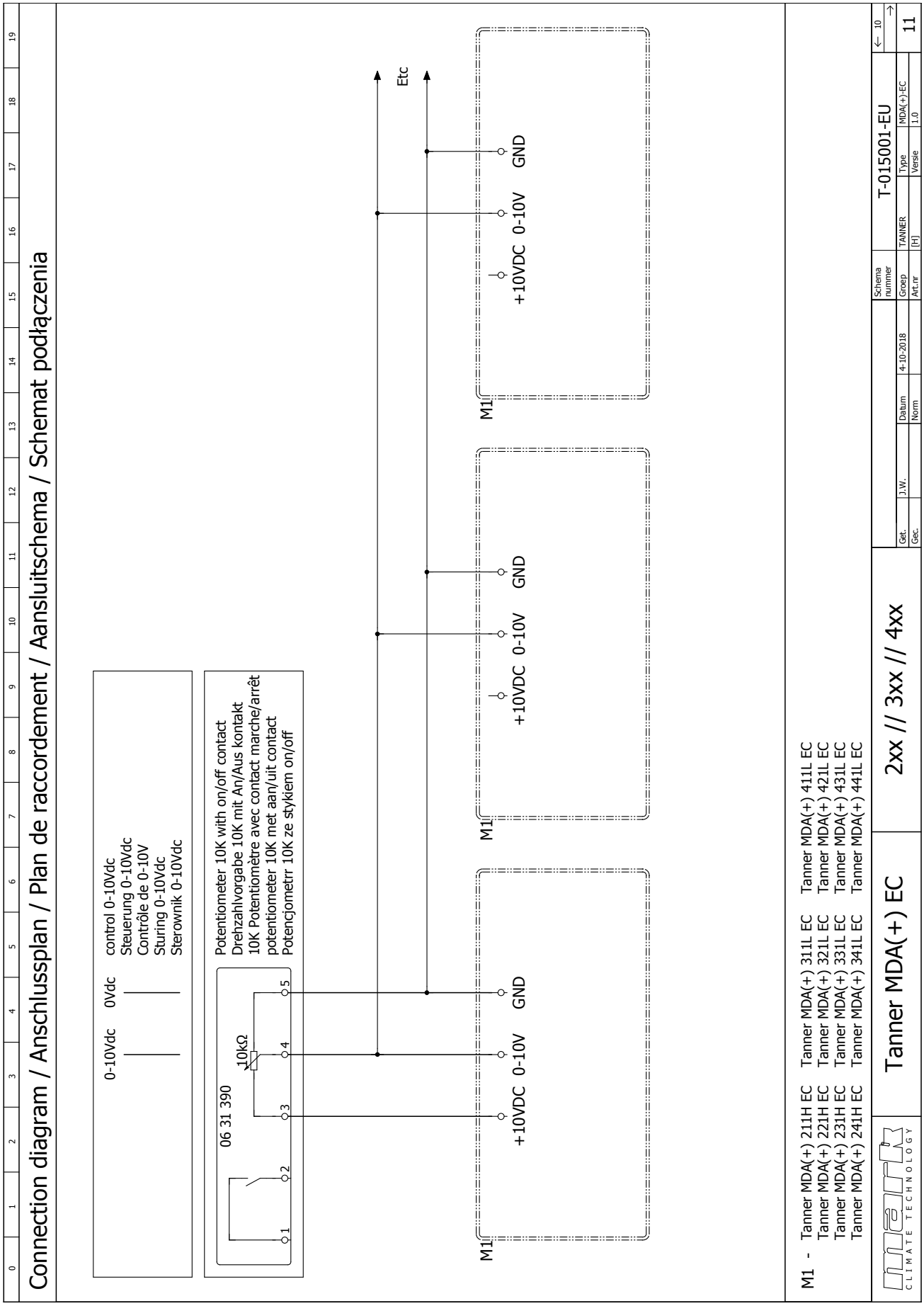
EN

5.3 Connection diagram for Tanner MDA+ 241 / 341 / 441 with EC-fan



L = Lead | N = Zero | PE = Earth

5.4 Connection diagram for multiple Tanner MDA+ 241 / 341 / 441 with EC-fan



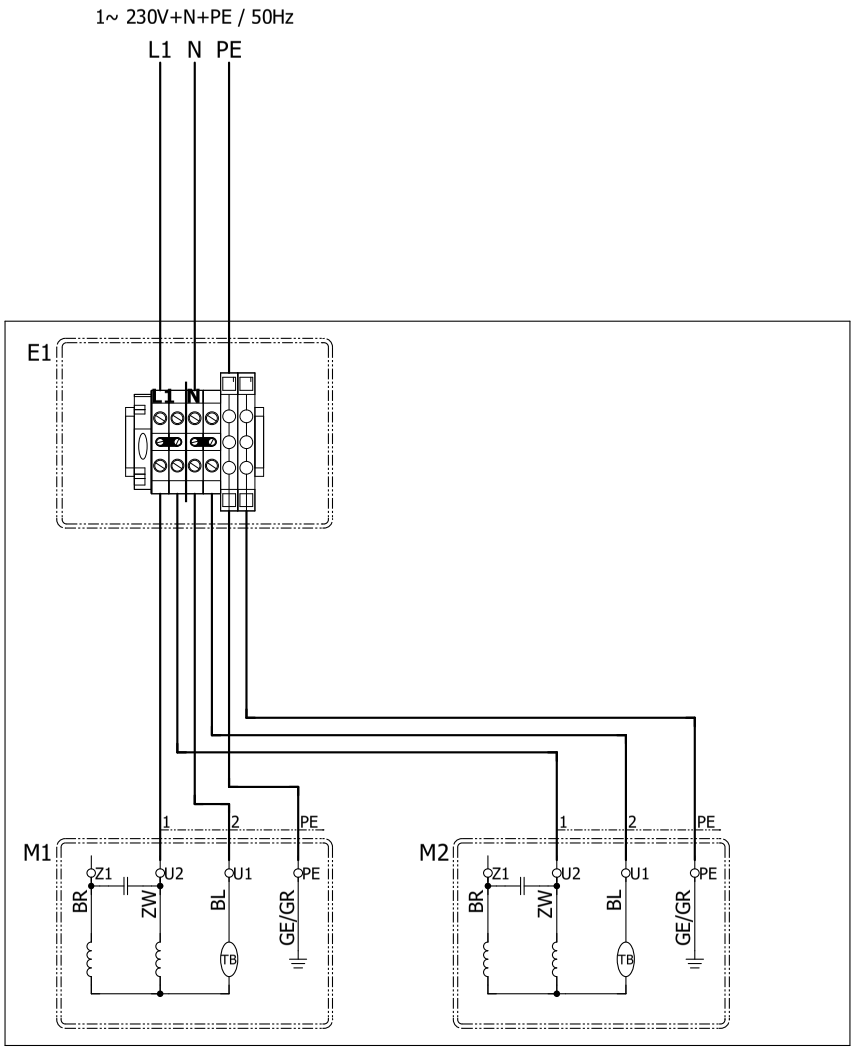
L = Lead | N = Zero | PE = Earth

EN

L = Lead | N = Zero | PE = Earth

5.6 Connection diagram for Tanner MDA+ 541 230Vac

Connection diagram / Anschlussplan / Plan de raccordement / Aansluitschema / Schemat podłączenia



Tanner MDA(+) 531L
Tanner MDA(+) 541L

TK - Thermal contact Thermokontakt Contact thermique Thermocontact Podłączenie termostatu	E1 - Connection box Abzweigdose Boîte de bornes Klemmenkast Skrzynka zaciskowa

BL - blue blau bleu blauw niebieski	BR - brown braun brun bruin brązowy	ZW - black schwarz noir zwart czarny	GNYE - yellow/green gelb/grün jaune/verde geel/groen żółty/zielony

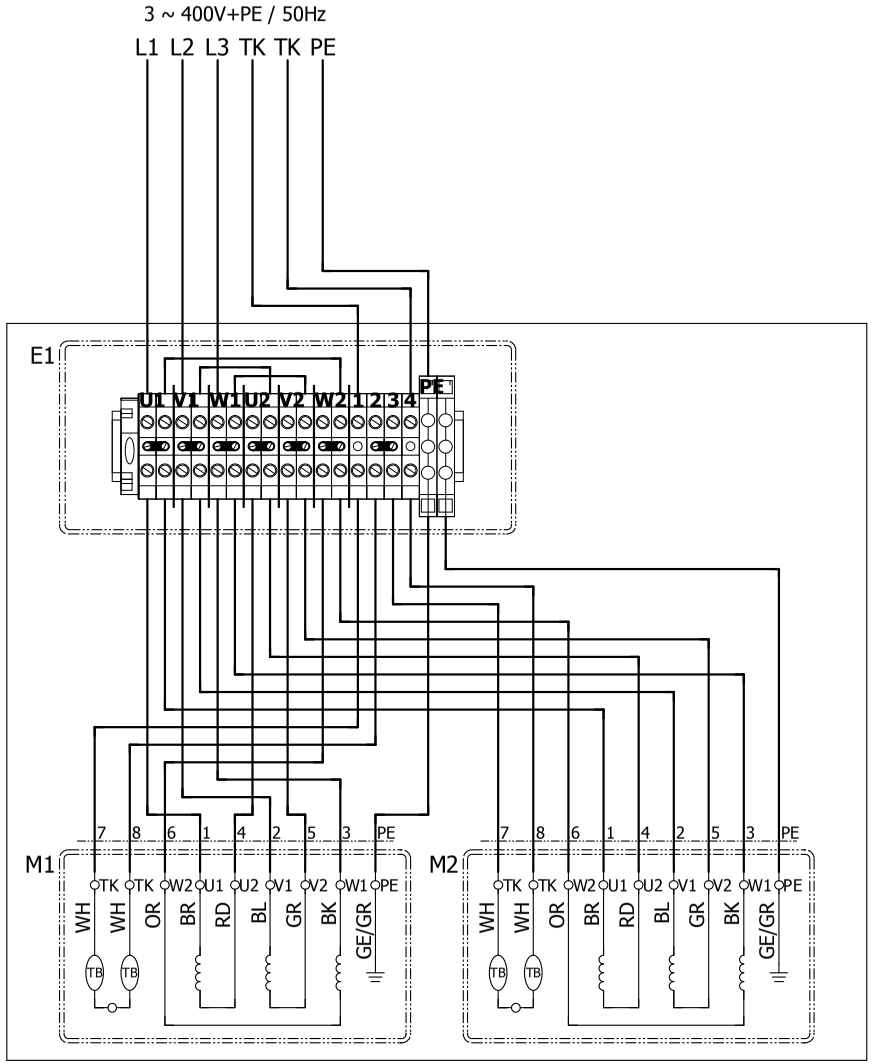
mark CLIMATE TECHNOLOGY	Tanner MDA(+) 230Vac	5xx	Electrical drawing

Schema nummer	T-011001-EU						← 30 →
Get.	J.W.	Datum	8-6-2022	Groep	Tanner	Type	MDA
Gec.	TvD	Norm		Art.nr	[H]	Versie	1.1

10

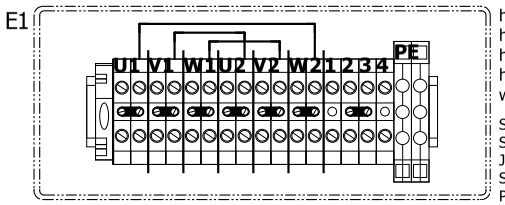
L = Lead | N = Zero | PE = Earth

Connection diagram / Anschlussplan / Plan de raccordement / Aansluitschema / Schemat podłączenia



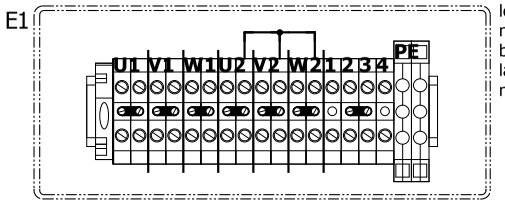
Tanner MDA(+) 533L
Tanner MDA(+) 543L

By changing L1 and L2 you can change the rotation direction
Mittels Umtauschen L1 und L2 kann man die Drehrichtung ändern
En inversant L1 et L2, on change la direction de rotation
Door het verwisselen van L1 en L2, verandert de draairichting
Poprzez zmianę zasilania L1 i L2 można zmienić kierunek rotacji

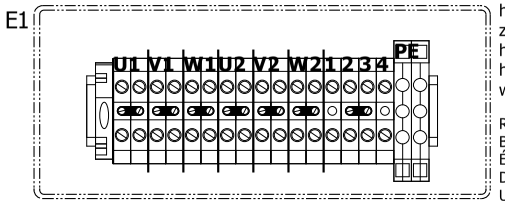


high
hoch
haut
hoog
wysoko

Standard connection made from factory
Standard brücken ab Fabrik
Jumper standard de l'usine
Standaard doorverbinding vanaf fabriek
Połączenia wykonane przez fabrykę



low
niedrig
bas
laag
nisko



high/low
zweistufig
haut/bas
hoog/laag
wysoko/nisko

Remove connection !!!
Brücke entfernen !!!
Éliminer les connexions !!!
Doorverbinding verwijderen !!!
Usuń połączenie !!!

TK - Thermal contact Thermokontakt Contact thermique Thermocontact Podłączenie termostatu		E1 - Connection box Abzweigdose Boîte de bornes Klemmenkast Skrzynka zaciskowa	
BL - blue blau bleu blauw niebieski	BK - black schwarz noir zwart czarny	GNYE - yellow/green gelb/grün jaune/verde geel/groen żółty/zielony	RD - red rot rouge rood czerwony
BR - brown braun brun bruin brązowy	GR - grey grau gris grijs szary	OR - orange orange orange oranje pomarańczowy	WH - white weiß blanc wit biały

mark CLIMATE TECHNOLOGY

Tanner MDA(+) 400Vac

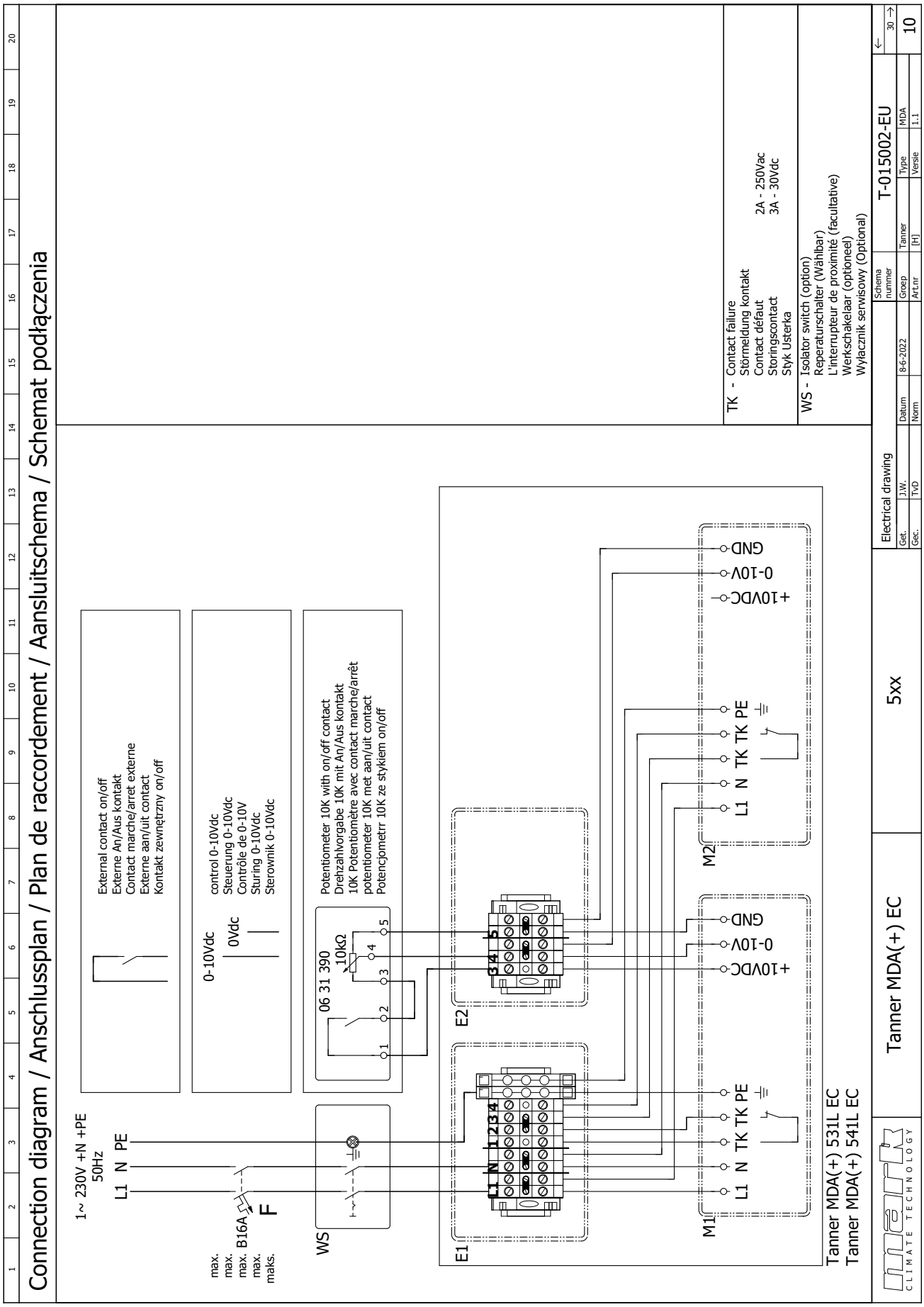
5xx

Electrical drawing				Schema nummer	T-012001-EU		← 30 →
Get.	J.W.	Datum	7-1-2021	Groep	Tanner	Type	MDA
Gec.	TvD	Norm		Art.nr	[H]	Versie	1.0

10

EN

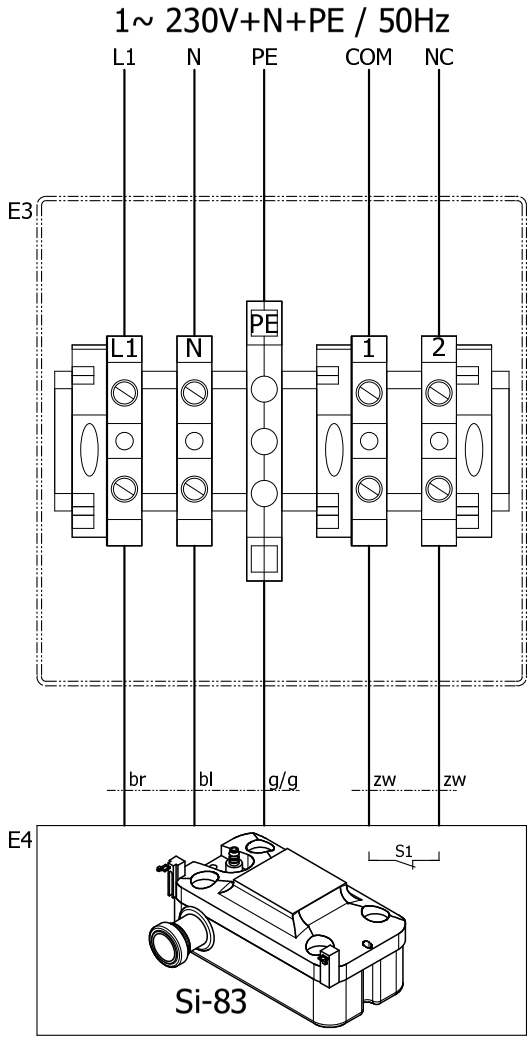
5.8 Connection diagram for Tanner MDA+ 541 with EC-fan

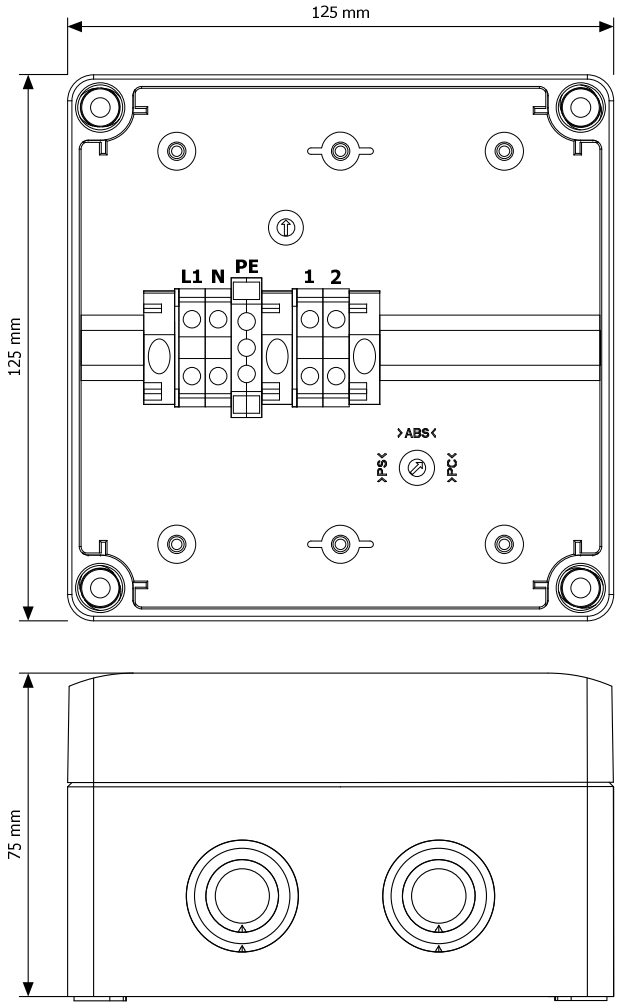


L = Lead | N = Zero | PE = Earth

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

EN - Connection diagram junction box safety switch
FR - Plan de raccordement boîtier de connection interrupteur de sécurité
PL - Schemat podłączenia skrzynka przyłączeniowa przełącznik bezpieczeństwa
DE - Anschlussplan Anschlussbox sicherheits Schalter
NL - Aansluitschema aansluitbox veiligheidsschakelaar
RO - Schema de conexiune cutii de joncțiune întrerupător de siguranță





Wiring colours
Farbe der Verdrähtung
Couleurs de câblage
Kleuren bedrading
Kolory przewodów
Culori cablaje

br	brown braun brun bruin brązowy maro	g/g	yellow/green gelb/grün jaune/verde geel/groen żółty/zielony galben/verde
bl	blue blau bleu blauw niebieski Albastru	zw	black schwarz noir zwart czarny negru

E4 - Condensate pump
Kondensatpumpe
Pompe à condensat
Condensaatpomp
Pompa kondensatu
Pompa de condens

E3 - Junction box
Anschlussbox
Boîtier de connection
Aansluitbox
Skrzynka przyłączeniowa
cutii de joncțiune

S1 - Safety switch
Sicherheits Schalter
Interrupteur de sécurité
Veiligheidsschakelaar
Przełącznik bezpieczeństwa
Întrerupător de siguranță

mark CLIMATE TECHNOLOGY

30.04.491

Electrical drawing				Schema nummer	A-004050-EU		
Get.	J.W.	Datum	1-3-2024	Groep	Algemeen	Type	A
Gec.		Norm		Art.nr	300491	Versie	1.0

10

EN

6.0 Performance charts

6.1 Performance chart Tanner MDA+ 241 EC

	241 EC	Control Signal EC fan [VDC]									
		10	9	8	7	6	5	4	3	2	1
heating	90/70 T15°C [kW]	43,13	41,3	37,79	34,57	30,64	26,27	20,92	16,21	N/A	N/A
	dP water [kPa]	2,54	2,34	1,98	1,68	1,4	1	0,66	0,41	N/A	N/A
	80/60 T15°C [kW]	34,93	33,44	30,6	27,98	24,79	21,22	16,82	12,87	N/A	N/A
	dP water [kPa]	1,73	1,6	1,35	1,15	0,91	0,68	0,44	0,27	N/A	N/A
	60/40 T15°C [kW]	13,56	12,86	12,2	11,56	10,73	9,73	8,36	7,01	N/A	N/A
	dP water [kPa]	0,31	0,28	0,25	0,23	0,2	0,17	0,13	0,09	N/A	N/A
	45/40 T 15°C [kW]	18,57	17,77	16,23	14,82	13,1	11,2	8,88	6,85	N/A	N/A
	dP water [kPa]	7,46	6,87	5,79	4,89	3,88	2,9	1,88	1,16	N/A	N/A
	35/30 T 15°C [kW]	10,5	10,04	9,14	8,32	7,3	6,14	4,52	3,7	N/A	N/A
	dP water [kPa]	2,63	2,42	2,03	1,7	1,34	0,97	0,55	0,38	N/A	N/A
	Air amount [m3/h]	3734	3495	3060	2686	2261	1826	1348	975	N/A	N/A
cooling	7/12 T28°C (RH = 50%)	N/A	N/A	N/A	7,83	6,37	5,66	5,02	4,41	N/A	N/A
	dP water [kPa]	N/A	N/A	N/A	2,15	1,48	1,19	0,96	0,75	N/A	N/A
	Air amount [m^3/h]	N/A	N/A	N/A	2686	2261	1826	1348	975	N/A	N/A
	Connection	N/A	N/A	N/A	1,0"	1,0"	1,0"	1,0"	1,0"	N/A	N/A
	Sound dB(A)*	55	54	51	48	44	40	34	30	N/A	N/A

6.2 Performance chart Tanner MDA+ 341 EC

	341 EC	Control Signal EC fan [VDC]									
		10	9	8	7	6	5	4	3	2	1
heating	90/70 T15°C [kW]	68,66	63,62	59,83	54,77	49,62	45,29	38,13	27,27	N/A	N/A
	dP water [kPa]	2,76	2,4	2,14	1,82	1,52	1,28	0,93	0,5	N/A	N/A
	80/60 T15°C [kW]	56,39	52,26	49,17	45,02	40,8	37,24	31,34	22,36	N/A	N/A
	dP water [kPa]	1,95	1,7	1,52	1,29	1,08	0,91	0,66	0,36	N/A	N/A
	60/40 T15°C [kW]	29,7	27,33	25,52	23,02	20,32	16,43	14,57	11,52	N/A	N/A
	dP water [kPa]	0,63	0,54	0,48	0,39	0,31	0,21	0,17	0,11	N/A	N/A
	45/40 T 15°C [kW]	29,34	27,15	25,5	23,31	21,08	19,21	16,12	11.46	N/A	N/A
	dP water [kPa]	8	6,93	6,18	5,23	4,35	3,67	2,65	1,42	N/A	N/A
	35/30 T 15°C [kW]	17,28	15,99	15,02	13,72	12,39	11,27	9,4	6,33	N/A	N/A
	dP water [kPa]	3,1	2,69	2,4	2,03	1,68	1,41	1,02	0,49	N/A	N/A
	Air amount [m3/h]	5423	4847	4435	3910	3406	3005	2387	1554	N/A	N/A
cooling	7/12 T28°C (RH = 50%)	N/A	N/A	N/A	11,99	9,81	9,17	8,07	6,64	N/A	N/A
	dP water [kPa]	N/A	N/A	N/A	1,72	1,2	1,06	0,84	0,59	N/A	N/A
	Air amount [m^3/h]	N/A	N/A	N/A	3910	3406	3005	2387	1554	N/A	N/A
	Connection	N/A	N/A	N/A	1,25"	1,25"	1,25"	1,25"	1,25"	N/A	N/A
	Sound dB(A)*	53	51	48	46	41	37	33	29	N/A	N/A

* measured at a distance of 5 meter

6.3 Performance chart Tanner MDA+ 441 EC

441 EC	Control Signal EC fan [VDC]									
	10	9	8	7	6	5	4	3	2	1
heating										
90/70 T15°C [kW]	105,2	102,94	88,99	7910	72,65	62,4	53,82	51,06	N/A	N/A
dP water [kPa]	4,05	3,89	2,98	2,4	2,05	1,55	1,19	1,08	N/A	N/A
80/60 T15°C [kW]	86,93	85,07	73,62	65,48	60,16	51,7	44,61	42,32	N/A	N/A
dP water [kPa]	2,91	2,8	2,14	1,73	1,48	1,12	0,86	0,78	N/A	N/A
60/40 T15°C [kW]	48,37	47,32	40,79	36,09	31,97	27,86	21,54	19,96	N/A	N/A
dP water [kPa]	1,04	1	0,76	0,61	0,52	0,38	0,24	0,21	N/A	N/A
45/40 T 15°C [kW]	44,84	43,86	37,82	33,55	30,76	26,35	22,66	21,48	N/A	N/A
dP water [kPa]	11,68	11,22	8,56	6,87	5,86	4,41	3,35	3,04	N/A	N/A
35/30 T 15°C [kW]	26,88	26,3	22,7	20,14	18,48	15,82	13,58	12,86	N/A	N/A
dP water [kPa]	4,71	4,53	3,46	2,78	2,38	1,79	1,36	1,23	N/A	N/A
Air amount [m3/h]	8217	7956	6438	5450	4844	3941	3242	3028	N/A	N/A
cooling										
7/12 T28°C (RH = 50%)	N/A	N/A	N/A	21,17	19,46	16,34	11,36	10,93	N/A	N/A
dP water [kPa]	N/A	N/A	N/A	3,32	2,86	2,08	1,07	1	N/A	N/A
Air amount [m^3/h]	N/A	N/A	N/A	5450	4844	3941	3242	3028	N/A	N/A
Connection	N/A	N/A	N/A	1,5"	1,5"	1,5"	1,5"	1,5"	N/A	N/A
Sound dB(A)*	59	58	55	52	48	43	37	31	N/A	N/A

6.4 Performance chart Tanner MDA+ 541 EC

541 EC	Control Signal EC fan [VDC]									
	10	9	8	7	6	5	4	3	2	1
heating										
90/70 T15°C [kW]	152,51	141,25	132,8	121,47	109,93	100,19	84,12	59,77	N/A	N/A
dP water [kPa]	5,98	5,2	4,65	3,96	3,3	2,79	2,04	1,1	N/A	N/A
80/60 T15°C [kW]	127,03	117,74	110,76	101,39	91,84	83,77	70,45	50,19	N/A	N/A
dP water [kPa]	4,39	3,82	3,42	2,92	2,44	2,07	1,51	0,82	N/A	N/A
60/40 T15°C [kW]	74,41	69,1	65,09	59,7	54,18	49,5	41,7	29,67	N/A	N/A
dP water [kPa]	1,76	1,54	1,38	1,18	0,99	0,84	0,62	0,34	N/A	N/A
45/40 T 15°C [kW]	64,67	59,8	56,16	51,27	46,31	42,13	35,25	24,88	N/A	N/A
dP water [kPa]	17,1	14,84	13,24	11.23	9,34	7,87	5,71	3,04	N/A	N/A
35/30 T 15°C [kW]	39,59	36,67	34,47	31,53	28,52	25,99	21,81	15,46	N/A	N/A
dP water [kPa]	7,28	6,34	5,67	4,82	4,03	3,4	2,48	1,33	N/A	N/A
Air amount [m^3/h]	10600	9474	8669	7643	6658	5873	4666	3037	N/A	N/A
cooling										
7/12 T28°C (RH = 50%)	N/A	N/A	N/A	36,49	33,66	31,18	26,87	19,78	N/A	N/A
dP water [kPa]	N/A	N/A	N/A	6,55	5,68	4,95	3,79	2,19	N/A	N/A
Air amount [m^3/h]	N/A	N/A	N/A	7643	6658	5873	4666	3037	N/A	N/A
Connection	N/A	N/A	N/A	2,0"	2,0"	2,0"	2,0"	2,0"	N/A	N/A
Sound dB(A)*	56	54	51	49	44	40	36	32	N/A	N/A

* measured at a distance of 5 meter

MARK BV
BENEDEN VERLAAT 87-89
VEENDAM (NEDERLAND)
POSTBUS 13, 9640 AA VEENDAM
TELEFOON +31(0)598 656600
FAX +31 (0)598 624584
info@mark.nl
www.mark.nl

MARK EIRE BV
COOLEA, MACROOM
CO. CORK
P12 W660 (IRELAND)
PHONE +353 (0)26 45334
FAX +353 (0)26 45383
sales@markeire.com
www.markeire.com

MARK BELGIUM b.v.b.a.
KERNERGIESTRAAT 47, UNIT G
2610 ANTWERPEN-WILRIJK
(BELGIË/BELGIQUE)
TELEFOON +32 (0)3 6669254
info@markbelgium.be
www.markbelgium.be

MARK DEUTSCHLAND GmbH
MAX-PLANCK-STRASSE 16
46446 EMMERICH AM RHEIN
(DEUTSCHLAND)
TELEFON +49 (0)2822 97728-0
TELEFAX +49 (0)2822 97728-10
info@mark.de
www.mark.de

MARK POLSKA Sp. z o.o
UL. JASNOGÓRSKA 27
42-202 CZĘSTOCHOWA (POLSKA)
PHONE +48 34 3683443
FAX +48 34 3683553
info@markpolska.pl
www.markpolska.pl

MARK SRL ROMANIA
STR. BANEASA NO 8 (VIA STR. LIBERTATII)
540199 TÂRGU-MURES, JUD MURES
(ROMANIA)
TEL/FAX +40 (0)265-266.332
office@markromania.ro
www.markromania.ro