

Technician's Handbook

SIGMA CONTROL BASIC Compressor Controller

Software SBS 01.01S/R and SBS 01.02S/R

Version 01 DE

Subject to change!

Manufacturer:

KAESER KOMPRESSOREN GmbH

PO Box 21 43 • 96410 Coburg • Germany • Tel. + 49 9561 640-0 • Fax. + 49 9561 640-130
<http://www.kaeser.com>

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1 Extract from Service Manual

1.1 Keys and Indicators

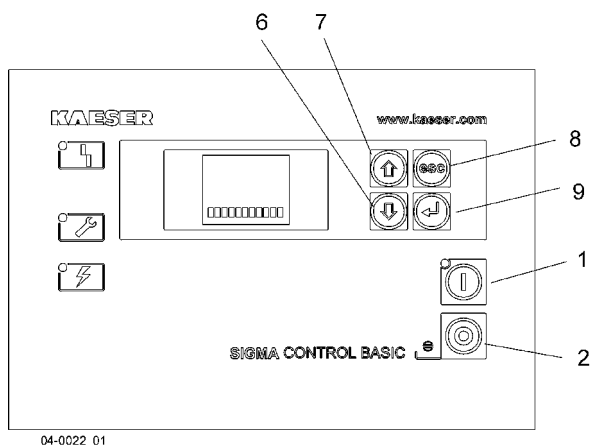


Fig. 1 Keys

Symbol	Item	Description	Function
	1	ON (I)	Switch the machine on.
	2	OFF (0)	Switch the machine off. Acknowledges alarm messages and resets event memory.
	6	Arrow key	Scrolls down parameter list. Reduces a parameter value.
	7	Arrow key	Scrolls up the parameter list. Increases a parameter value.
	8	Escape	Exits the edit mode without saving.
	9	Return/enter/save key	Only affects the message in the third line of the display (12). Jumps to the edit mode. Saves and leaves the edit mode.

Tab. 1 Buttons

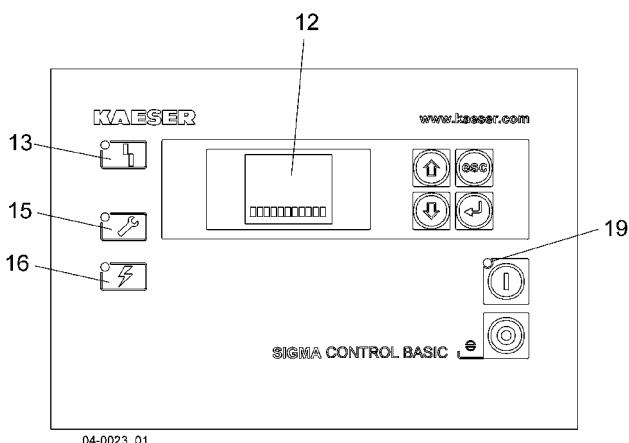


Fig. 2 Indicators

Symbol	Item	Description	Function
	12	Display field (Display)	Alphanumeric display with 4 lines.
	13	Alarm	Blinks red when an alarm occurs. Lights continuously when acknowledged.
	15	Service/warning LED	Lights continuously yellow for: – maintenance work required – warning message
	16	Controller voltage	Lights green when the power supply to the controller is switched on.
	19	Machine ON	Lights green when the machine is switched on.

Tab. 2 Displays

1.2 Function Description

1.2.1 Display field layout (Display, Position 12, Fig. 2)

Line 1		x x . x b a r
Line 2		y y ° C
Line 3	z	0 0 0 0 h
Line 4		1 2 3 4 5 6 7 8 S p T i

Fig. 3 Display layout (Display)

Line	Display	Meaning
1	XX.X	Current system pressure in bar, psi or MPa.
2	yy	Current airdischarge temperature (ADT) in ° C or ° F.
3	0...9	Parameter display and setting (see Tab. 4)
4	1,2...	Alarm and warning messages (see Tab. 5 and Tab. 6)

Tab. 3 Display field (Display)

1.2.2 Display of Parameters

Line	Display	Meaning
3	0	Operating hours counter Displays the period in which the motor was switched on.
	1	Load hours counter This shows the number of hours the compressor has operated under load.
	2	Maintenance interval counter Displays the number of operating hours until the next scheduled maintenance. It counts back from a set value. The warning message "S" is displayed when the counter reaches zero. When maintenance is complete the counter should be reset to its original value. The interval begins to run out again.
	3	Pressure relief valve check mode on/off (password protected) This switches the pressure relief valve blowoff pressure check on and off. The warning message "i" is displayed when the check mode is switched on. Checking and finding password: see chapter LEERER MERKER.
	4	Temperature display units The aircend discharge temperature can be displayed in °C or °F.
	5	Pressure display units Current working pressure can be displayed in bar, psi or MPa.
	6	Activate refrigeration dryer: on/off In this operating mode the integrated refrigeration dryer operates (if provided). on: Impulse timer off: Continuous
	7	System pressure: Switching differential The switching differential is the difference between cut-in pressure and cut-out pressure (required system pressure) and determines the frequency of switching between LOAD and IDLE RUNNING. Setting range: -0.1...-5.0 bar
	8	Required system pressure: switching point The switching point is the required pressure of the air main (system pressure) and the cut-out pressure of the compressor. Setting range (bar): 5.5...maximum system pressure
9	Maximum working pressure The compressor can deliver air up to this pressure (see nameplate). The maximum working pressure is factory-set and can only be changed by authorized KAESER service	

Tab. 4 Parameters

1.2.3 Parameter setting

The edit mode can be entered by depressing the "Enter" key for three seconds.

If a password is needed it is requested automatically.

Every action may be retracted by means of the escape key (esc).



If no key is pressed in the edit mode for ten seconds the display automatically returns to the previous mode.

Restarting the controller is not necessary. Edited parameters are immediately effective.

System pressure and airtend discharge temperature are neither updated nor displayed whilst in the edit mode.

☞ Scroll with the arrow keys until the desired parameter appears in line 3.

☞ Depress the enter key for at least three seconds.

Without password protection

The current parameter setting blinks.

☞ Use the arrow keys to change the setting and confirm with the enter key.

With password protection

The password consists of five characters. The first character blinks.

☞ Use the arrow keys to change the setting and confirm with the enter key.

The next character blinks.

☞ Repeat setting until all characters are entered.








When the correct password is entered the parameters are displayed.

☞ Use the arrow keys to change the setting and confirm with the enter key.





1.2.4 Alarm and warning message recognition

A complete list with instructions on fault rectification is given in chapter 9.

Alarm messages (machine shuts down)

Line	Display	Symbol	Meaning
4	1		Safety chain EMERGENCY STOP button pressed. Access door open (if provided).
	2		Motor fault Overload protection of drive or fan motor (if provided).
	3		Back pressure present. Incorrect motor rotation direction. – Drive belt broken – Compressor not vented on standstill.
	4		Maximum permissible airend discharge temperature exceeded.
	5		Fault in the refrigeration dryer.
	6		Defective analog input (pressure or temperature sensor).
	7		Maximum permissible temperature of the controller exceeded.
	8		Reserve

Tab. 5 Alarms
Warning messages (machine does not shut down)

Line	Display	Symbol	Meaning
4	S		Maintenance interval elapsed.
	p		Back pressure present.
	T		Machine below minimum permissible starting temperature.
	i		Pressure relief valve check modus switched on.

Tab. 6 Warning messages

2 Special Chapter for Service Technicians

2.1 Setting operating hours and hours under load counters

Both counters can be set as long as their readings are between 1h and 5h, i.e. if the reading is 5h it can no longer be changed.

2.2 Passwords

Activating the relief valve test requires the password "BASIC"

The maximum operating pressure can be changed by Kaeser Service with the password "CERES" (only necessary when modifying the machine for a different pressure).

2.3 Changing the units of measurement for the airdend discharge temperature or system pressure

The temperature and pressure readings will not be updated as long as the change mode is active and the units selected.

2.4 Power failure

When power is restored, the controller resumes its previous state, i.e. the compressor starts automatically and any current faults remain registered.

2.5 Refrigeration dryer operating mode

- Continuous (off)
The dryer runs as long as the controller is switched on, i.e. also if the compressor is in standby mode.
- Impulse timer (on)
The dryer runs so long as the compressor is running. When the compressor switches to standby the dryer runs on for one minute then switches off for ten minutes. This cycle (1 min / 10 min) continues until the compressor restarts.

2.6 Resetting the maximum working pressure is done only after machine modification.

A change can only be made by means of the Kaeser Service password "CERES".

2.7 Starting sequence

Compressor motor start

Star–delta start

1. Refrigerant compressor on
2. if the refrigeration compressor relay answer–back contact is closed, star contactor on
3. after 0.3 seconds
mains contactor on
4. after 6.0 seconds (star time)
star contactor off
5. after 0.03 seconds
delta contactor on
6. after 1.0 seconds
load valve open

2.8 ADT

Not all temperature limit settings are adjustable.

- Alarm message ADT > > (maximum permissible airend discharge temperature exceeded)
ADT > 110 °C The compressor shuts down after 2 seconds.
ADT > 120 °C The compressor shuts down immediately.
The alarm can be acknowledged when the temperature drops below 105 °C.
- Alarm message ADT < < (airend discharge temperature below permissible minimum)
The warning message "T" indicates that the operating temperature is below the permitted minimum (-10 °C). Motor starting is inhibited.
The controller can be switched on but the motor start inhibit is only lifted when the temperature rises above -10 °C.

Minimum operating temperature monitoring is only active before the motor is started; no reaction occurs if the temperature falls below -10 °C while the motor is running.

2.9 Analog Inputs Monitoring

- Analog pressure input (4–20mA)
The input current must be in the range
3mA (-1bar) <= I<= 20mA (16 bar)
An alarm is signalled if it moves out of this range.
- Analog temperature input (PT100)
An open analog input is recognised by a temperature exceeding the limit of + 150 °C and a short between analog inputs or to the casing by a drop in temperature below -46 °C.

Parallel to this, monitoring of open input or short to earth (also resistance breakdown) is achieved by registration of an error current on AI2 by means of an electronic switch on the board.

2.10 Internal Temperature Acquisition

The internal temperature of the controller is available to the system as an analog value. An alarm message is triggered if the temperature exceeds 65 °C. The alarm is cancelled if the internal temperature falls below 50 °C.

3 Example Electrical Diagram

Electrical diagrams
Compressor series ASK
 with SIGMA CONTROL BASIC
 200V±10% 50Hz 230V±10% 50/60Hz
 380V±10% 60Hz 400V±10% 50Hz
 440V±10% 60Hz 460V±10% 60Hz
 TT/TN power supply with common point grounding

ATTENTION !!!
 The document gives collective information on power supply voltages and frequencies for all machines. The voltage and frequency and local conditions under which any particular machine may be used are given on the nameplate of the machine and in the accompanying service manual.

Manufacturer: KAESER KOMPRESSOREN GmbH
 96450 Coburg
 GERMANY

The drawings remain our exclusive property. They are entrusted only for the agreed purpose. Copies or any other reproductions, including storage, treatment and dissemination by use of electronic systems must not be made for any other than the agreed purpose. Neither originals nor reproductions must be forwarded or otherwise made accessible to third parties.

c	Datum	11.03.2004	E	Cover page Compressor series ASK	=	+
b	Bearb.	Sifler				
a	Gepr.	Büchner		DASK.B-02010.00	Blatt 1	Bl.
A	Änderung	Datum	Name			
				KAESER KOMPRESSOREN Ursprung: AAS02013_00		

Lfd. Nr. No.	Benennung Name	Zeichnungsnummer (Kunde) Drawing No. (customer)	Zeichnungsnummer (Hersteller) Drawing No. (manufacturer)	Blatt Page	Anlagenkennzeichen Unit designation
1	Cover page		DASK.B-02010.00	1	
2	List of contents		ZASK.B-02010.00	1	
3	Block diagram		UASK.B-02010.00	1	
4	Block diagram	performance-related components	UASK.B-02010.00	2	
5	Block diagram	performance-related components	UASK.B-02010.00	3	
6	Block diagram	performance-related components	UASK.B-02010.00	4	
7	Circuit diagram	Power switching	SASK.B-02010.00	1	
8	Circuit diagram	Control voltage tapping	SASK.B-02010.00	2	
9	Circuit diagram	supply/Relay-outputs	SASK.B-02010.00	3	
10	Circuit diagram	inputs internal	SASK.B-02010.00	4	
11	Circuit diagram	inputs/outputs external	SASK.B-02010.00	5	
12	Circuit diagram	transformer diagrams	SASK.B-02010.00	6	
13	Terminal schedule	Terminal strip -X0,-X11	KASK.B-02010.00	1	
14	Terminal schedule	option T3/-X31,-IX31,-ZX31	KASK.B-02010.00	2	
15	Component layout	Mounting plate	AASK.B-02010.00	1	

List of contents		=	
Compressor series ASK		+	ZASK.B-02010.00
Blatt 1			
Bl.			

	Datum	11.03.2004
a	Bearb. Sitzer	
	Gepr. Büchner	
b	Name	
	Norm	
B	Erstellt durch:	
	Ersetzt durch:	
	Ursprung:	

1	2	3	4	5	6	7	8																																																																
<h2>general instructions</h2> <p>ATTENTION !!! Install supplies, grounding and shock protection to local safety regulations. Control circuits are single-end-earthed; operate with insulation monitoring only. Do not make or break live plug-in connectors.</p> <p>control cabinet wiring for non-designated conductors primary circuits: black Control voltage AC: red 1mm² H05V-K Control voltage DC: blue 1mm² H05V-K external voltage: orange 1,5mm² H07V-K measuring circuits: violet 1mm² H05V-K earth conductor: green/yellow</p> <hr/> <p>option T2 = transformer power supply for refrigeration dryer option T3 = option refrigeration dryer</p> <hr/> <h2>electrical equipment identification</h2> <h3>general components</h3> <ul style="list-style-type: none"> -A10 SIGMA CONTROL BASIC -G1 Power supply -K1M Mains contactor -K2M Delta contactor -K3M Star contactor -M1 Compressor motor -Q0 Overload protection switch, Control transformer -T1 Control transformer -Y1 Control valve <h3>option T3 - refrigeration dryer</h3> <ul style="list-style-type: none"> -A04 Condensate drain -K8M Motor contactor -M11 Compressor motor -M12 Fan motor -Q12 Overload protection switch -T2 Transformer <h3>terminal strips/plug-in connections</h3> <ul style="list-style-type: none"> -X0 Terminal strip, Power supply -X11 Terminal strip, Control -X31 Terminal strip refrigeration dryer, option T3 -1X31,-2X31 Connector plug refrigeration dryer, option T3 <h3>Fault indicator</h3> <p><i>Shutdown function and Indicating function:</i></p> <ul style="list-style-type: none"> -B2 Direction of rotation pressure switch -B11 Temperature probe, Air end discharge temperature -B30 Safety pressure switch, option T3 -F2 Overload protection Compressor motor -S3 EMERGENCY STOP pushbutton <p><i>Indicating function:</i></p> <ul style="list-style-type: none"> -B1 Pressure transducer, Air main pressure 																																																																							
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model		performance-related components ASK 27 / ASK 27 T					Blatt 2 Bl.	
machine power supply		200 V ±10% 50 Hz	230 V ±10% 50 Hz 230 V ±10% 60 Hz	380 V ±10% 60 Hz	400 V ±10% 50 Hz	440 V ±10% 60 Hz 460 V ±10% 60 Hz		
Motor	-M1	15 kW diagram 2, Sht. 1	15 kW diagram 2, Sht. 1	15 kW diagram 1, Sht. 1	15 kW diagram 1, Sht. 1	15 kW diagram 1, Sht. 1		
supply terminals	-X0 Siemens	7.314.0.02090 3RV1935-5A	7.314.0.02090 3RV1935-5A	7.314.0.02080 3RV1915-5A	7.314.0.02080 3RV1915-5A	7.314.0.02080 3RV1915-5A		
terminal strips	-X11 -X11/-X31	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland		
Contactor	-K1M	7.6868.0 3RT1035-1AL20	7.6868.0 3RT1035-1AL20	7.6866.0 3RT1026-1AL20	7.6866.0 3RT1026-1AL20	7.6866.0 3RT1026-1AL20		
Auxiliary switch		2x 7.314.0.01690 3RH1921-1CA10	2x 7.314.0.01690 3RH1921-1CA10	2x 7.314.0.01690 3RH1921-1CA10	2x 7.314.0.01690 3RH1921-1CA10	2x 7.314.0.01690 3RH1921-1CA10		
Interference suppressor	Siemens	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00		
Contactor	-K2M	7.6868.0 3RT1035-1AL20	7.6868.0 3RT1035-1AL20	7.6866.0 3RT1026-1AL20	7.6866.0 3RT1026-1AL20	7.6866.0 3RT1026-1AL20		
Auxiliary switch		7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01		
Interference suppressor	Siemens	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00		
Contactor	-K3M	7.6866.0 3RT1026-1AL20	7.6866.0 3RT1026-1AL20	7.6865.0 3RT1025-1AL20	7.6865.0 3RT1025-1AL20	7.6865.0 3RT1025-1AL20		
Auxiliary switch		7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10		
Auxiliary switch		7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01		
Interference suppressor	Siemens	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00		
Contactor	-K8M	7.6874.0 3RT1016-1AP01	7.6874.0 3RT1016-1AP01	7.6874.0 3RT1016-1AP01	7.6874.0 3RT1016-1AP01	7.6874.0 3RT1016-1AP01		
Interference suppressor	Siemens	7.314.0.01790 3RT1916-1CD00	7.314.0.01790 3RT1916-1CD00	7.314.0.01790 3RT1916-1CD00	7.314.0.01790 3RT1916-1CD00	7.314.0.01790 3RT1916-1CD00		
Overload protection	-F2 Siemens	7.6873.00030 3RB1036-1UB0 13-50 A	7.6873.00030 3RB1036-1UB0 13-50 A	7.6873.00020 3RB1026-1QB0 6-25 A	7.6873.00020 3RB1026-1QB0 6-25 A	7.6873.00020 3RB1026-1QB0 6-25 A		
Overload protection switch	-Q0 Siemens	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,9 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A		
Overload protection switch	-Q12 (ASK 27 T)	7.6860.00190 3RV1011-1JA10 7-10 A setting: 8,1 A	7.6860.00190 3RV1011-1JA10 7-10 A setting: 7,0 A	7.6860.00160 3RV1011-1FA10 3,5-5 A setting: 4,3 A	7.6860.00160 3RV1011-1FA10 3,5-5 A setting: 3,7 A	7.6860.00160 3RV1011-1FA10 3,5-5 A setting: 3,7 A		
Auxiliary switch	Siemens	7.314.0.01890 3RV1901-1E	7.314.0.01890 3RV1901-1E	7.314.0.01890 3RV1901-1E	7.314.0.01890 3RV1901-1E	7.314.0.01890 3RV1901-1E		
Transformer	-T1	7.0776.10040 9916497 Eltra 160 VA diagram 2, Sht. 6	7.0776.10040 9916497 Eltra 160 VA diagram 2, Sht. 6	7.0775.2 B0001089 Block 160 VA diagram 1, Sht. 6	7.0775.2 B0001089 Block 160 VA diagram 1, Sht. 6	7.0776.10040 9916497 Eltra 160 VA diagram 2, Sht. 6		
Transformer	-T2 (ASK 27 T)	7.2292.10060 USTE1600 Block 7,0 A diagram 11, Sht. 6	---	7.2292.10060 USTE1600 Block 7,0 A diagram 11, Sht. 6	7.3717.00240 B0312005 Block 400/230 V, 6,4 A diagram 10, Sht. 6	7.2292.10060 USTE1600 Block 7,0 A diagram 11, Sht. 6		
Power supply	-G1 Siemens	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A		
connection	-W13 Siemens	7.314.0.02120 3RV1935-1A	7.314.0.02120 3RV1935-1A	7.314.0.02110 3RT1926-4CC20	7.314.0.02110 3RT1926-4CC20	7.314.0.02110 3RT1926-4CC20		
connection	-W14	H07V-K black 3x1x6 mm ²	H07V-K black 3x1x6 mm ²	7.314.0.02130 3RA1923-3D Siemens	7.314.0.02130 3RA1923-3D Siemens	7.314.0.02130 3RA1923-3D Siemens		
cables	-W19.1/2	YwSLYw-J 750 V 2x4x10 mm ²	YwSLYw-J 750 V 2x4x10 mm ²	YwSLYw-J 750 V 2x4x4 mm ²	YwSLYw-J 750 V 2x4x4 mm ²	YwSLYw-J 750 V 2x4x4 mm ²		
Compressor control	-A10 Siemens	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC		
EMERGENCY STOP pushbutton	-S3	7.3217.0 QRUV	7.3217.0 QRUV	7.3217.0 QRUV	7.3217.0 QRUV	7.3217.0 QRUV		
Switching element	Schlegel	7.3218.0 MHT00	7.3218.0 MHT00	7.3218.0 MHT00	7.3218.0 MHT00	7.3218.0 MHT00		
Control cabinet	KAESER	7.7677.0	7.7677.0	7.7677.0	7.7677.0	7.7677.0		
Mounting plate	KAESER	209602.0	209602.0	209602.0	209602.0	209602.0		

Block diagram
Compressor series ASK

KAESER
KOMPRESSOREN

Ursprung:

Ersetzt für:

Ersetzt durch:

Datum 11.03.2004
Bearb. Siffer
Gepr. Büchner

Norm
Name

Datum

Änderung

UASK.B-02010.00

model		performance-related components ASK 32 / ASK 32 T				
machine power supply		200 V ±10% 50 Hz	230 V ±10% 50 Hz 230 V ±10% 60 Hz	380 V ±10% 60 Hz	400 V ±10% 50 Hz	440 V ±10% 60 Hz 460 V ±10% 60 Hz
Motor	-M1	18,5 kW diagram 2, Sht. 1	18,5 kW diagram 2, Sht. 1	18,5 kW diagram 1, Sht. 1	18,5 kW diagram 1, Sht. 1	18,5 kW diagram 1, Sht. 1
supply terminals	-X0 Siemens	7.314.0.02090 3RV1935-5A	7.314.0.02090 3RV1935-5A	7.314.0.02080 3RV1915-5A	7.314.0.02080 3RV1915-5A	7.314.0.02090 3RV1935-5A
terminal strips	-X11 -X11/-X31	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland
Contactor	-K1M	7.6869.0 3RT1036-1AL20	7.6869.0 3RT1036-1AL20	7.6866.0 3RT1026-1AL20	7.6866.0 3RT1026-1AL20	7.6867.0 3RT1034-1AL20
Auxiliary switch		2x 7.314.0.01690 3RH1921-1CA10	2x 7.314.0.01690 3RH1921-1CA10	2x 7.314.0.01690 3RH1921-1CA10	2x 7.314.0.01690 3RH1921-1CA10	2x 7.314.0.01690 3RH1921-1CA10
Interference suppressor	Siemens	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.00920 3RT1936-1CD00
Contactor	-K2M	7.6869.0 3RT1036-1AL20	7.6869.0 3RT1036-1AL20	7.6866.0 3RT1026-1AL20	7.6866.0 3RT1026-1AL20	7.6867.0 3RT1034-1AL20
Auxiliary switch		7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01
Interference suppressor	Siemens	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.00920 3RT1936-1CD00
Contactor	-K3M	7.6867.0 3RT1034-1AL20	7.6867.0 3RT1034-1AL20	7.6865.0 3RT1025-1AL20	7.6865.0 3RT1025-1AL20	7.6865.0 3RT1025-1AL20
Auxiliary switch		7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10
Auxiliary switch		7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01
Interference suppressor	Siemens	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1936-1CD00
Contactor	-K8M	7.6874.0 3RT1016-1AP01	7.6874.0 3RT1016-1AP01	7.6874.0 3RT1016-1AP01	7.6874.0 3RT1016-1AP01	7.6874.0 3RT1016-1AP01
Interference suppressor	Siemens	7.314.0.01790 3RT1916-1CD00	7.314.0.01790 3RT1916-1CD00	7.314.0.01790 3RT1916-1CD00	7.314.0.01790 3RT1916-1CD00	7.314.0.01790 3RT1916-1CD00
Overload protection	-F2 Siemens	7.6873.00030 3RB1036-1UB0 13-50 A	7.6873.00030 3RB1036-1UB0 13-50 A	7.6873.00020 3RB1026-1QB0 6-25 A	7.6873.00020 3RB1026-1QB0 6-25 A	7.6873.00030 3RB1036-1UB0 13-50 A
Overload protection switch	-Q0 Siemens	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,9 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A
Overload protection switch	-Q12 (ASK 32 T)	7.6860.00190 3RV1011-1JA10 7-10 A setting: 8,1 A	7.6860.00190 3RV1011-1JA10 7-10 A setting: 7,0 A	7.6860.00160 3RV1011-1FA10 3,5-5 A setting: 4,3 A	7.6860.00160 3RV1011-1FA10 3,5-5 A setting: 3,7 A	7.6860.00160 3RV1011-1FA10 3,5-5 A setting: 3,7 A
Auxiliary switch	Siemens	7.314.0.01890 3RV1901-1E	7.314.0.01890 3RV1901-1E	7.314.0.01890 3RV1901-1E	7.314.0.01890 3RV1901-1E	7.314.0.01890 3RV1901-1E
Transformer	-T1	7.0776.10040 9916497 Eltra 160 VA diagram 2, Sht. 6	7.0776.10040 9916497 Eltra 160 VA diagram 2, Sht. 6	7.0775.2 B0001089 Block 160 VA diagram 1, Sht. 6	7.0775.2 B0001089 Block 160 VA diagram 1, Sht. 6	7.0776.10040 9916497 Eltra 160 VA diagram 2, Sht. 6
Transformer	-T2 (ASK 32 T) Block	7.2292.10060 USTE1600 Block 7,0 A diagram 11, Sht. 6	---	7.2292.10060 USTE1600 Block 7,0 A diagram 11, Sht. 6	7.3717.00240 B0312005 Block 400/230 V, 6,4 A diagram 10, Sht. 6	7.2292.10060 USTE1600 Block 7,0 A diagram 11, Sht. 6
Power supply	-G1 Siemens	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A
connection	-W13 Siemens	7.314.0.02120 3RV1935-1A	7.314.0.02120 3RV1935-1A	7.314.0.02110 3RT1926-4CC20	7.314.0.02110 3RT1926-4CC20	7.314.0.02110 3RT1926-4CC20
connection	-W14	7.314.0.02120 3RV1935-1A Siemens	7.314.0.02120 3RV1935-1A Siemens	7.314.0.02130 3RA1923-3D Siemens	7.314.0.02130 3RA1923-3D Siemens	H07V-K black 3x1x6 mm ²
cables	-W19.1/2	YwSLYw-J 750 V 2x4x16 mm ²	YwSLYw-J 750 V 2x4x10 mm ²	YwSLYw-J 750 V 2x4x6 mm ²	YwSLYw-J 750 V 2x4x4 mm ²	YwSLYw-J 750 V 2x4x4 mm ²
Compressor control	-A10 Siemens	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC
EMERGENCY STOP pushbutton	-S3	7.3217.0 QRUV	7.3217.0 QRUV	7.3217.0 QRUV	7.3217.0 QRUV	7.3217.0 QRUV
Switching element	Schlegel	7.3218.0 MHT00	7.3218.0 MHT00	7.3218.0 MHT00	7.3218.0 MHT00	7.3218.0 MHT00
Control cabinet	KAESER	7.7677.0	7.7677.0	7.7677.0	7.7677.0	7.7677.0
Mounting plate	KAESER	209602.0	209602.0	209602.0	209602.0	209602.0

Blatt 3

UASK.B-02010.00

Block diagram
Compressor series ASKKAESER
KOMPRESSOREN

Ursprung:

Ersatz für:

Ersatz durch:

Datum 11.03.2004

Bearb. Siffer

Gepr. Büchner

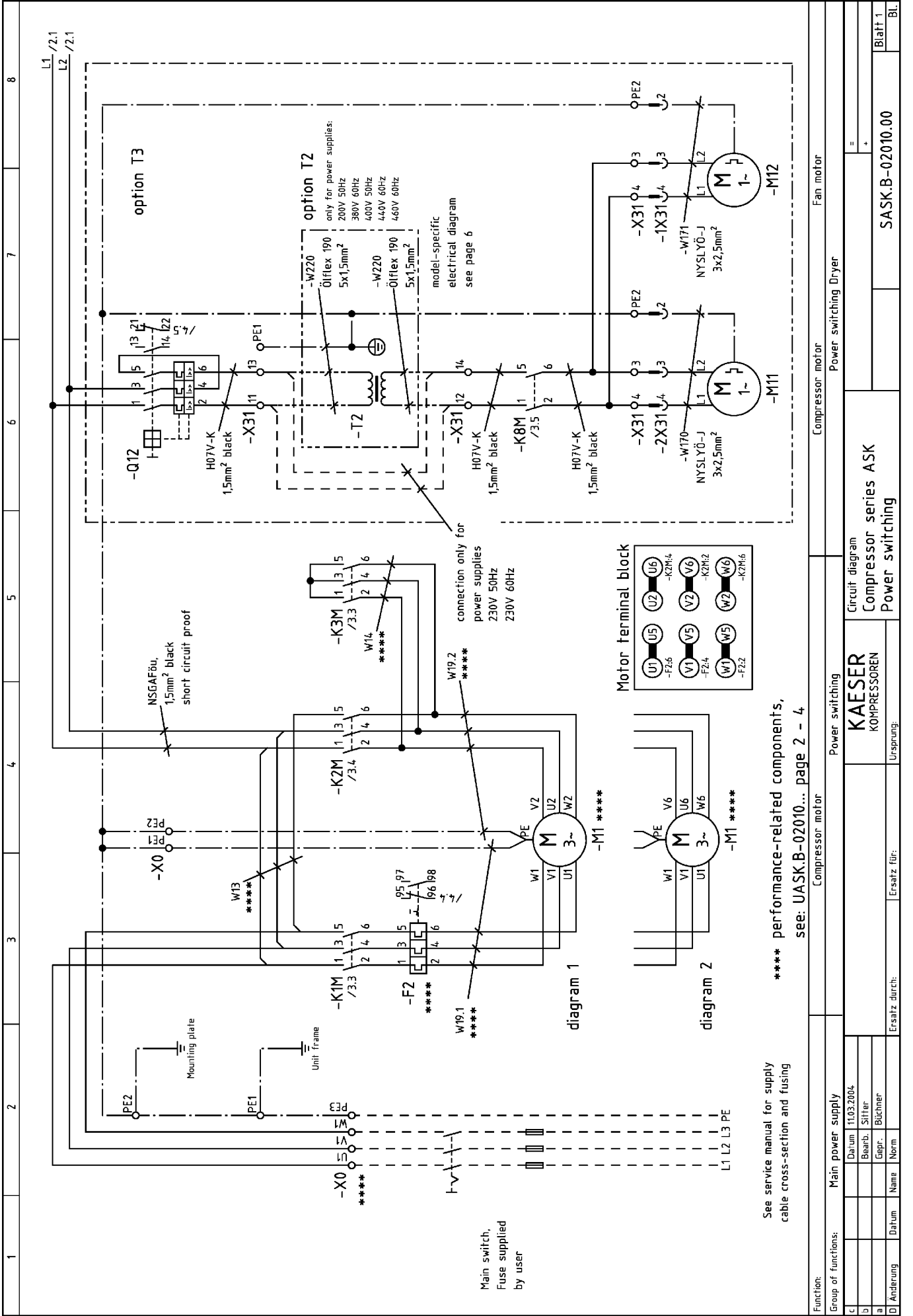
Norm

Name

Datum

Änderung

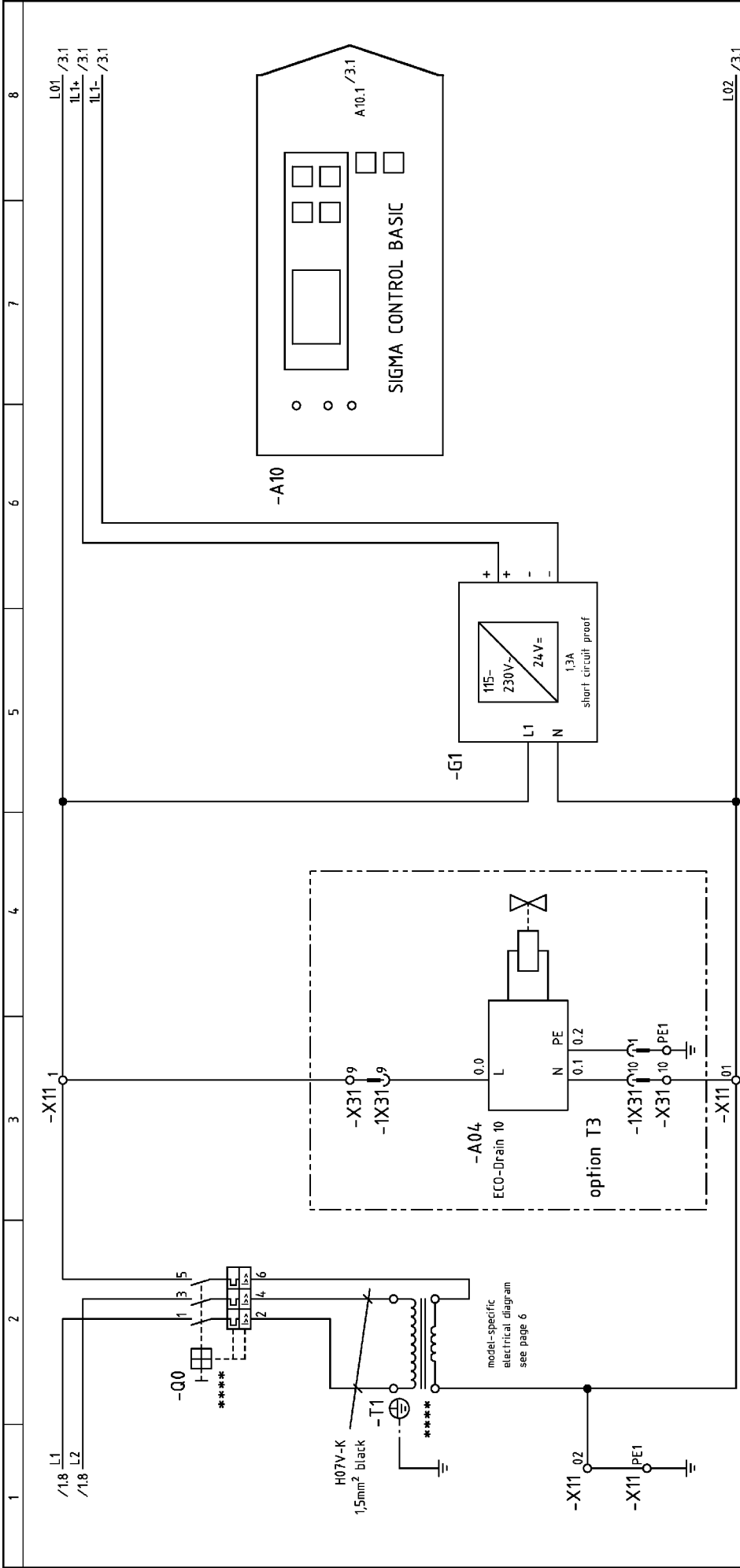
model		performance-related components ASK 35					Blatt 4	
machine power supply		200 V ±10% 50 Hz	230 V ±10% 50 Hz 230 V ±10% 60 Hz	380 V ±10% 60 Hz	400 V ±10% 50 Hz	440 V ±10% 60 Hz 460 V ±10% 60 Hz	UASK.B-02010.00	
Motor	-M1	22 kW diagram 2, Sht. 1	22 kW diagram 2, Sht. 1	22 kW diagram 1, Sht. 1	22 kW diagram 1, Sht. 1	22 kW diagram 1, Sht. 1	= +	
supply terminals	-X0 Siemens	3x 7.314.0.02100 3RA1943-3L	7.314.0.02090 3RV1935-5A	7.314.0.02090 3RV1935-5A	7.314.0.02090 3RV1935-5A	7.314.0.02090 3RV1935-5A		
Terminal strip	-X11	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland		
Contactor	-K1M	7.6870.0 3RT1044-1AL20	7.6869.0 3RT1036-1AL20	7.6867.0 3RT1034-1AL20	7.6867.0 3RT1034-1AL20	7.6867.0 3RT1034-1AL20		
Auxiliary switch		7.314.0.02230 3RH1921-1XA20-0PA0	2x 7.314.0.01690 3RH1921-1CA10	2x 7.314.0.01690 3RH1921-1CA10	2x 7.314.0.01690 3RH1921-1CA10	2x 7.314.0.01690 3RH1921-1CA10		
Interference suppressor	Siemens	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00		
Contactor	-K2M	7.6870.0 3RT1044-1AL20	7.6869.0 3RT1036-1AL20	7.6867.0 3RT1034-1AL20	7.6867.0 3RT1034-1AL20	7.6867.0 3RT1034-1AL20		
Auxiliary switch		7.314.0.02200 3RH1921-1DA11	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01		
Interference suppressor	Siemens	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00		
Contactor	-K3M	7.6867.0 3RT1034-1AL20	7.6867.0 3RT1034-1AL20	7.6865.0 3RT1025-1AL20	7.6865.0 3RT1025-1AL20	7.6865.0 3RT1025-1AL20		
Auxiliary switch		7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10	7.314.0.01690 3RH1921-1CA10		
Auxiliary switch		7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01	7.314.0.02030 3RH1921-1CA01		
Interference suppressor	Siemens	7.314.0.00920 3RT1936-1CD00	7.314.0.00920 3RT1936-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00	7.314.0.01400 3RT1926-1CD00		
Overload protection	-F2 Siemens	7.6873.00040 3RB1046-1UB0 13-50 A	7.6873.00030 3RB1036-1UB0 13-50 A	7.6873.00030 3RB1036-1UB0 13-50 A	7.6873.00030 3RB1036-1UB0 13-50 A	7.6873.00030 3RB1036-1UB0 13-50 A		
Overload protection switch	-Q0 Siemens	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,9 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A	7.6860.00090 3RV1011-0JA10 0,7-1 A setting: 0,77 A		
Transformer	-T1	7.0776.10040 9916497 Eltra 160 VA diagram 2, Sht. 6	7.0776.10040 9916497 Eltra 160 VA diagram 2, Sht. 6	7.0775.2 B0001089 Block 160 VA diagram 1, Sht. 6	7.0775.2 B0001089 Block 160 VA diagram 1, Sht. 6	7.0776.10040 9916497 Eltra 160 VA diagram 2, Sht. 6		
Power supply	-G1 Siemens	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A	7.7025.1 230VAC/24VDC 1,3A		
connection	-W13 Siemens	H07V-K black 3x1x16 mm ²	7.314.0.02120 3RV1935-1A	7.314.0.02120 3RV1935-1A	7.314.0.02120 3RV1935-1A	7.314.0.02120 3RV1935-1A		
connection	-W14	H07V-K black 3x1x16 mm ²	7.314.0.02120 3RV1935-1A Siemens	H07V-K black 3x1x6 mm ²	H07V-K black 3x1x6 mm ²	H07V-K black 3x1x6 mm ²		
cables	-W19.1/.2	YwSLYw-J 750 V 2x4x16 mm ²	YwSLYw-J 750 V 2x4x16 mm ²	YwSLYw-J 750 V 2x4x6 mm ²	YwSLYw-J 750 V 2x4x6 mm ²	YwSLYw-J 750 V 2x4x4 mm ²		
Compressor control	-A10 Siemens	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC	7.7005.0 SIGMA CONTROL BASIC		
EMERGENCY STOP pushbutton	-S3	7.3217.0 QRUV	7.3217.0 QRUV	7.3217.0 QRUV	7.3217.0 QRUV	7.3217.0 QRUV		
Switching element	Schlegel	7.3218.0 MHT00	7.3218.0 MHT00	7.3218.0 MHT00	7.3218.0 MHT00	7.3218.0 MHT00		
Control cabinet	KAESER	7.7677.0	7.7677.0	7.7677.0	7.7677.0	7.7677.0		
Mounting plate	KAESER	209602.0	209602.0	209602.0	209602.0	209602.0		
							Block diagram Compressor series ASK	
							KAESER KOMPRESSOREN	
							Ursprung:	
							Ersatz für:	
c	Datum	11.03.2004						
b	Bearb.	Sifher						
a	Gepr.	Büchner						
c	Änderung	Datum	Name					



See service manual for supply cable cross-section and fusing

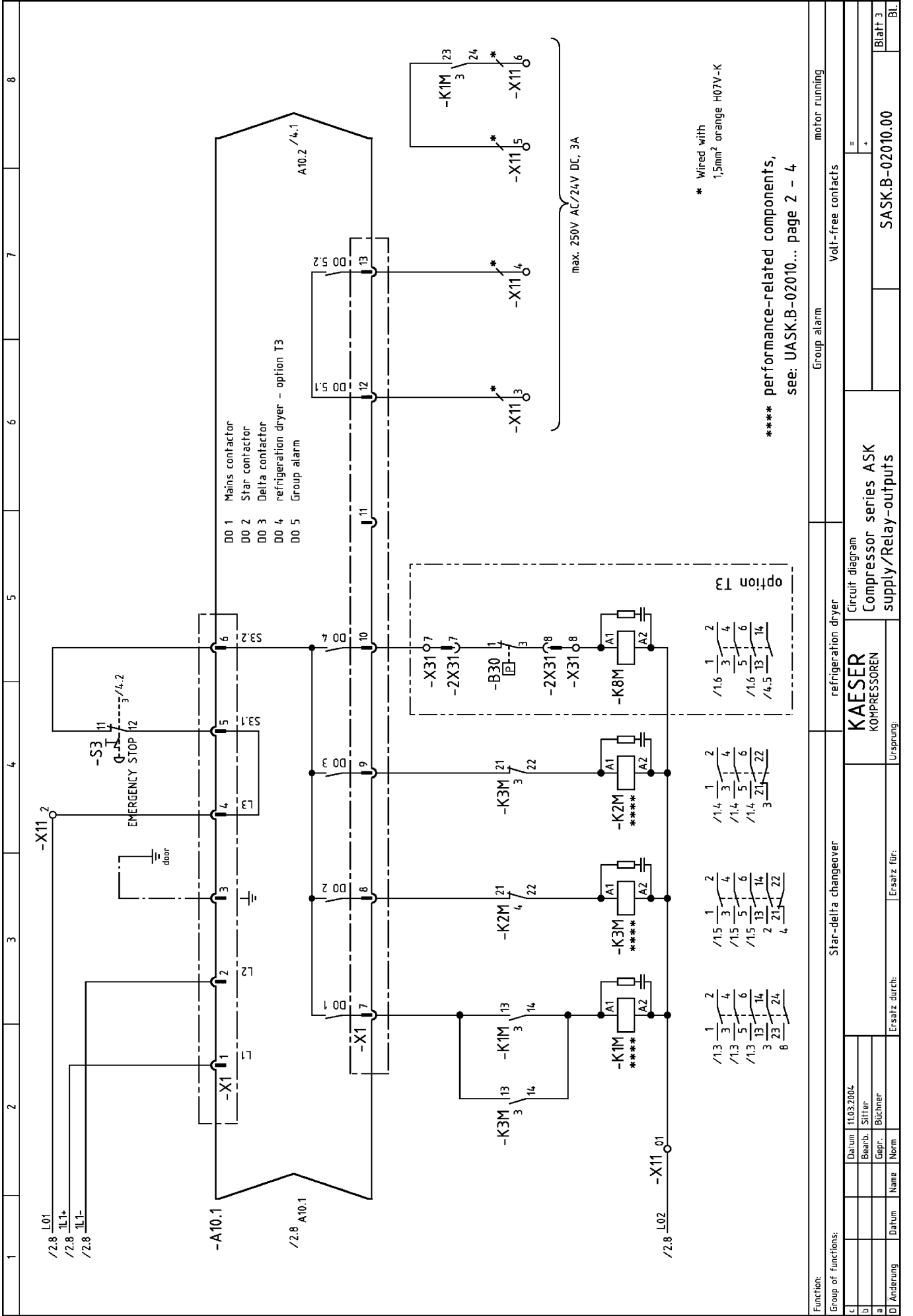
**** performance-related components, see: UASK.B-02010... page 2 - 4

Function:		Compressor motor		Compressor motor		Fan motor	
Group of functions:		Main power supply		Power switching		Power switching Dryer	
c	Datum	11.03.2004		Circuit diagram			
b	Bearb.	Sifler		Compressor series ASK			
a	Gepr.	Büchner		Power switching			
d	Änderung	Datum	Name	Norm	Ersetzt durch:	Ersetzung für:	Ursprung:
						SASK.B-02010.00	
						Blatt 1	
						Bl.	



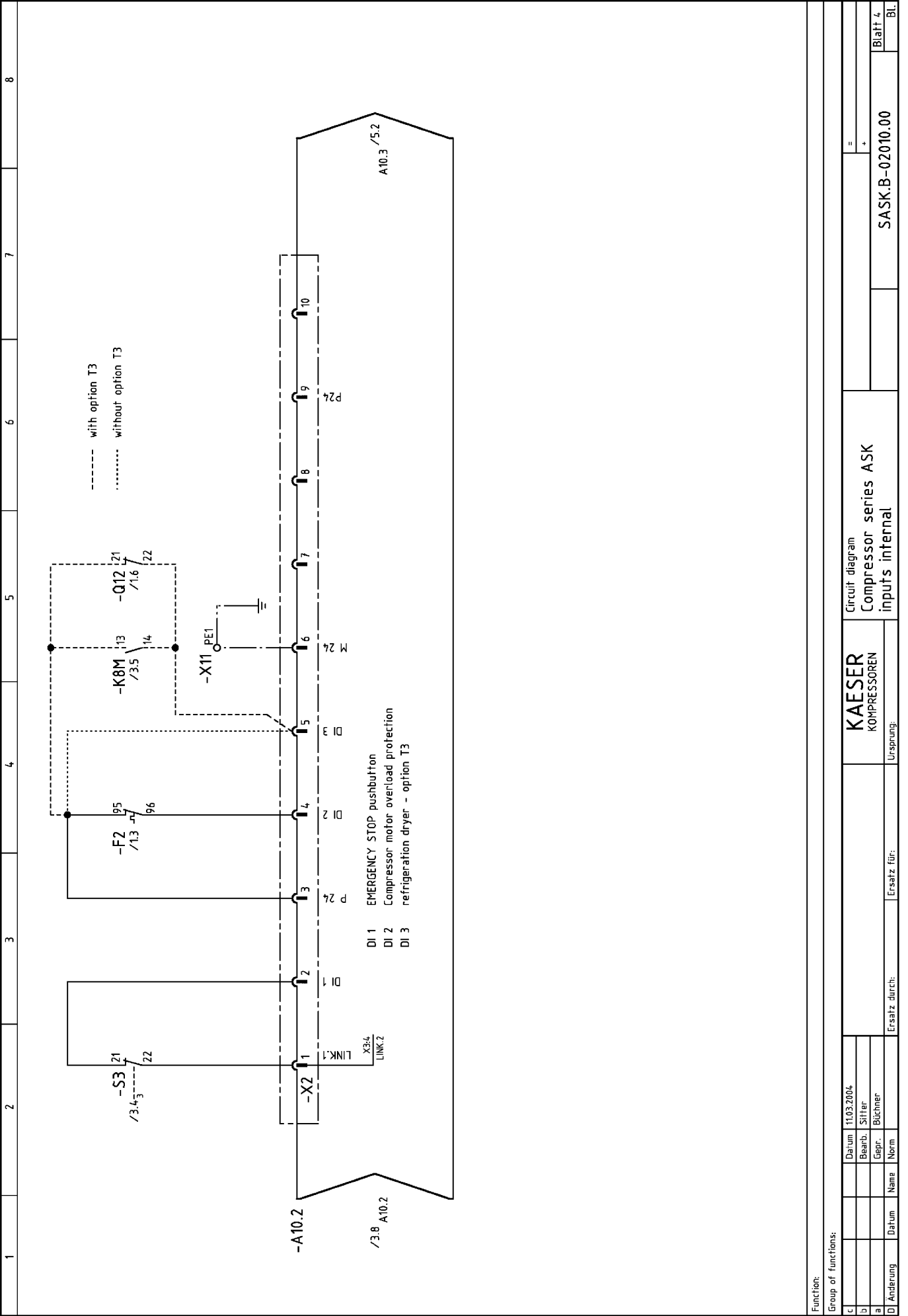
**** performance-related components,
see: UASK.B-02010... page 2 - 4

Function:		230V/1-/50/60Hz		Automatic condensate drain refrigeration dryer		24V DC	
Group of functions:		Control voltage tapping		Control voltage tapping		Control voltage tapping	
c	Datum	11.03.2004		Circuit diagram		=	
b	Bearb.	Sifler		Compressor series ASK		+	
a	Gepr.	Büchner		Control voltage tapping			
D	Änderung	Datum	Name	Norm	Erstsz durch:	Erstsz für:	Ursprung:
							SASK.B-02010.00
							Blatt 2
							BL



Function: refrigeration dryer / Star-delta changeover / Volt-free contacts / motor running

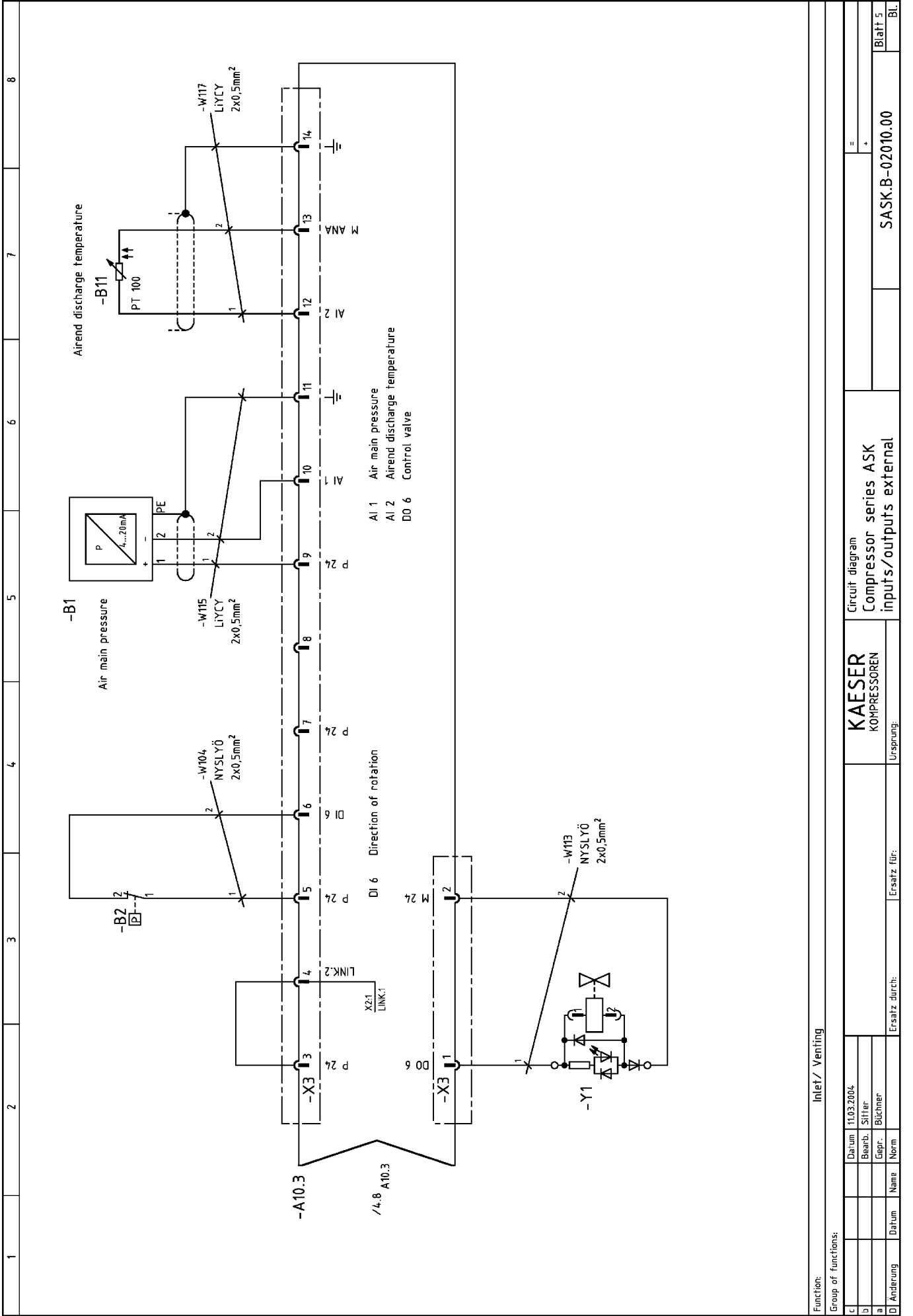
Group of functions:		Circuit diagram	
refrigeration dryer		Compressor series ASK	
Star-delta changeover		supply/Relay-outputs	
Ersatz durch:		Ersatz für:	
Ersatz durch:		Ersatz für:	
Datum		Norm	
11.03.2004			
Bearb. Siffer			
Gepr. Büchner			
Datum		Norm	
Blatt 3		SASK.B-02010.00	
Bl.			



Function:

Group of functions:

c	Datum	11.03.2004			=	
b	Bearb.	Sifler			+	
a	Gepr.	Büchner				
D	Änderung	Datum	Name	Norm	Ersatz durch:	Ersatz für:
					KAEISER KOMPRESSOREN	
					Circuit diagram Compressor series ASK inputs internal	
					SASK.B-02010.00	
					Blatt 4	
					Bl.	



Function:

Inlet/ Venting

Group of functions:

c	Datum	11.03.2004
b	Bearb.	Sifler
a	Gepr.	Büchner
D	Änderung	Datum Name Norm

KAESER
KOMPRESSOREN

Circuit diagram
Compressor series ASK
inputs/outputs external

Ursprung:

Ersatz durch:

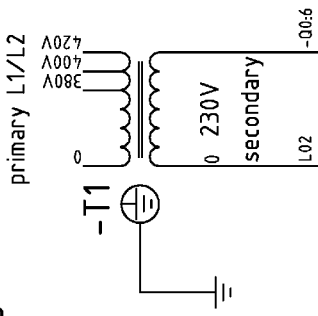
Ersatz für:

SASK.B-02010.00

Blatt 5

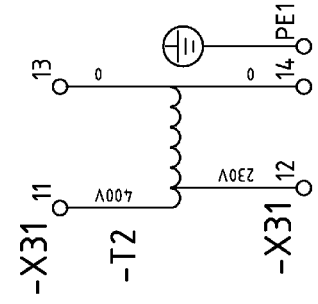
Bl.

diagram 1



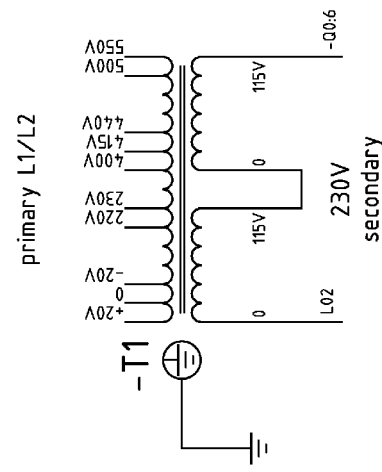
primary	Power connection	
	L1	L2
420V	0	420V
400V	0	400V
380V	0	380V

diagram 10



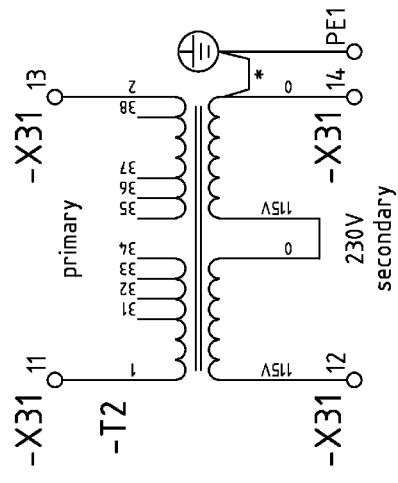
primary	Power connection	
	L1	L2
400V	0	400V

diagram 2



primary	Power connection	
	L1	L2
460V	+20V	440V
440V	0	440V
230V	0	230V
200V	-20V	220V

diagram 11

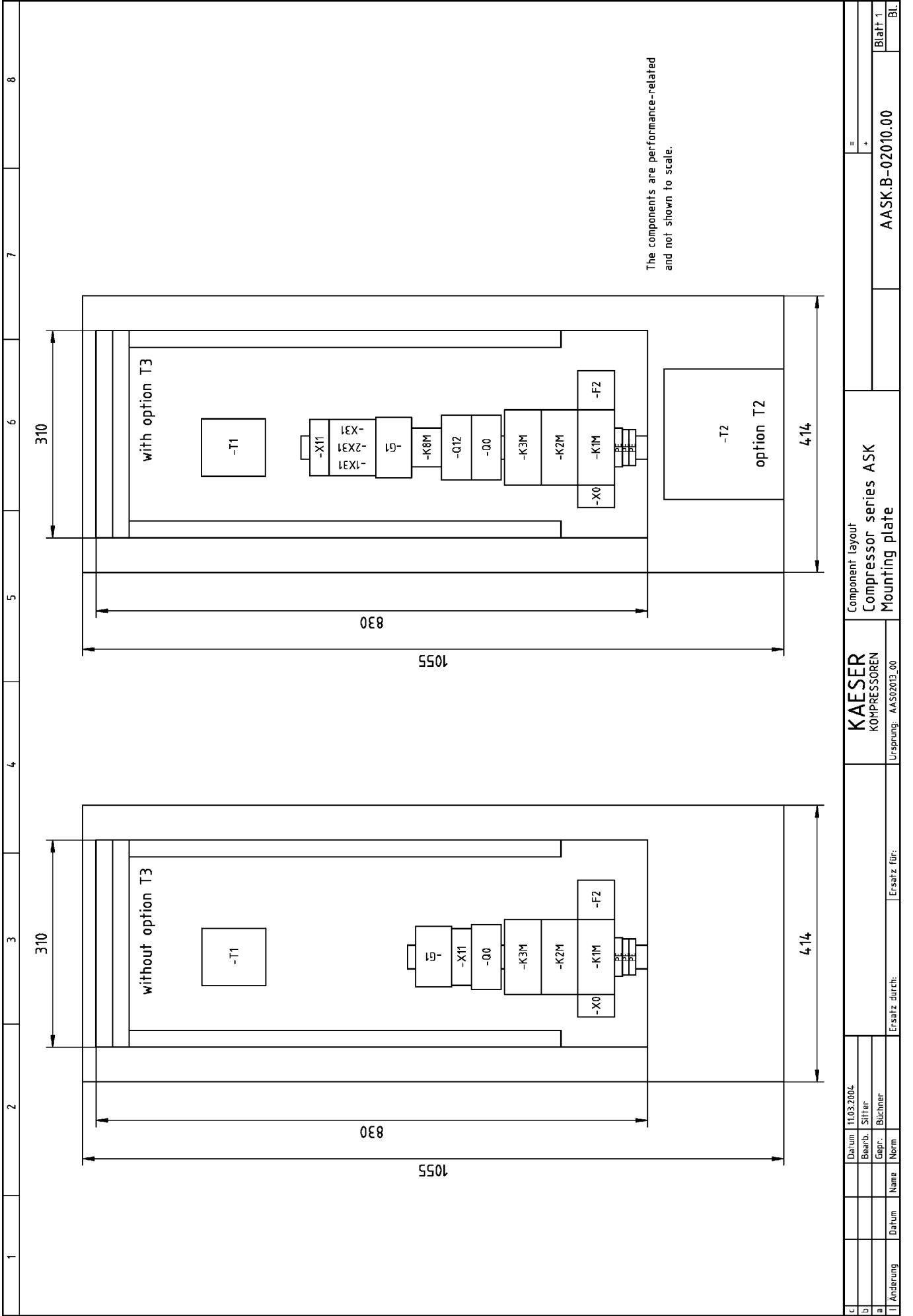


primary	Power connection 1-2	
	Jumper between:	
460V	32-36	
440V	32-37	
380V	31-38	
200V	1-37/2-31	

*** ATTENTION !!**

Make an earthing connection on the transformer between 0 and PE.

l	Datum	11.03.2004	Circuit diagram	
b	Bearb.	Sifler	Compressor series ASK	
a	Gepr.	Büchner	transformer diagrams	
D	Änderung	Datum	Ersetzt durch:	Ersetzung:
				Ursprung:
				KAESER KOMPRESSOREN
				SASK.B-02010.00
				Blatt 6
				BL



1	2	3	4	5	6	7	8
11 Änderung		Datum	Name	Ersatz durch:		Ersatz für:	
c		Datum	11.03.2004				
b		Bearb.	Sifler				
a		Gepr.	Büchner				
Component layout				= +			
Compressor series ASK				AASK.B-02010.00			
Mounting plate				Blatt 1			
				Bl.			

4 Technical Description of the External Load-Idle Retrofit Kit



Technical Description of SIGMA CONTROL BASIC

Program module for
remote load/idle control

Document: 7_7006_0 01D
Version: V1.1 16.02.2004
File name: TB_SCB_Pogramm-Modul_040216.DOC

KAESER KOMPRESSOREN GmbH

96410 Coburg • PO Box 2143 • GERMANY • Tel. +49-(0)9561-6400 • Fax +49-(0)9561 640130
<http://www.kaeser.com>

1. General

Specified Use

Software with the program module is intended specifically for controlling the load/idle phases of Kaeser compressors by means of a remote, volt-free contact. The program module may only be applied together with a SIGMA CONTROL BASIC controller. Any other use is considered incorrect.

Specified use also means adherence to installation, removal, commissioning, operational and maintenance conditions laid down by the manufacturer.

Liability

KAESER KOMPRESSOREN is not liable for any kind of damage or subsequent damage resulting if the software supplied cannot be used for any reason.

Copyright

The copyright of the software supplied is the property of KAESER KOMPRESSOREN. The end user is not entitled to pass on the software to any third party, either fully or in part.

The copyright of this service manual is the property of KAESER KOMPRESSOREN. This service manual may not be copied, either fully or in part, distributed or evaluated for competitive purposes or communicated to third parties unless authorized to do so.

Support Hotline

+49 9561 640 7979

Scope of Supply

- This service manual
- Program module with compressor software for controlling the load/idle phases of Kaeser compressors by means of a remote contact.

2. Function

2.1 With the module plugged in it is possible to control the load/idle phases by means of a remote, volt-free contact connected to input 14. The compressor runs under load when the contact is closed and in idle when it is open. After running in idle for 240 seconds the motor switches off and the compressor is then in the standby state. If the compressor on key (I) is pressed when the contact is open the compressor remains in the standby state. In the event of an unclear load signal (contact permanently closed) a degree of emergency control can be achieved and unnecessarily high system pressure and power consumption avoided by setting the cut-out pressure (parameter 8) at 0.4 bar above the required system pressure. In the case of a fault the controller regulates system pressure by means of parameters 8 and 7 (cut-out pressure and switching differential).

2.2 If, with the program module in place, it is required to regulate system pressure by means of the compressor controller rather than the remote contact it is necessary to set the cut-out pressure at the required system pressure (parameter 8) and connect a wire jumper between input 14 and P24.

2.3 When the program module has been inserted and power switched on the controller works only with the module program. The program stored in the controllers memory is permanently deleted. The module program is not transferred to the controller's memory so the compressor can no longer be operated without the module.

3. Installation

Attention!

Before starting work on any electrical system the following actions must be taken in the sequence given:

- 1. Switch off all phases**
- 2. Lock the switch in the 'of' position**
- 3. Check that no voltage is present**

**The module may only be installed by a qualified person.
KAESER KOMPRESSOREN cannot accept any liability for damage caused by the retrofit.**

3.1 Note counter readings

Counter readings are not taken over by the new software.

Note the following counter readings:

- parameter 0: operating hours
- parameter 1: hours under load
- parameter 2: hours to next service (interval)

3.2 Plugging in the program module

The module aperture is on the rear of the controller to the left and above the plug connector X1. The aperture is protected by a cover. Insert a screwdriver carefully in the slot on the left of the cover and prize it out of the aperture. The aperture is beveled on the upper right side. The module has a corresponding beveled corner. Push the module into the aperture until it clicks into place.

3.3 Checking acceptance of the new program

- Start the controller and allow it to boot up.
- Switch the controller off.
- Switch the controller on again. During booting up the display should show:
SBSxx.xx_R

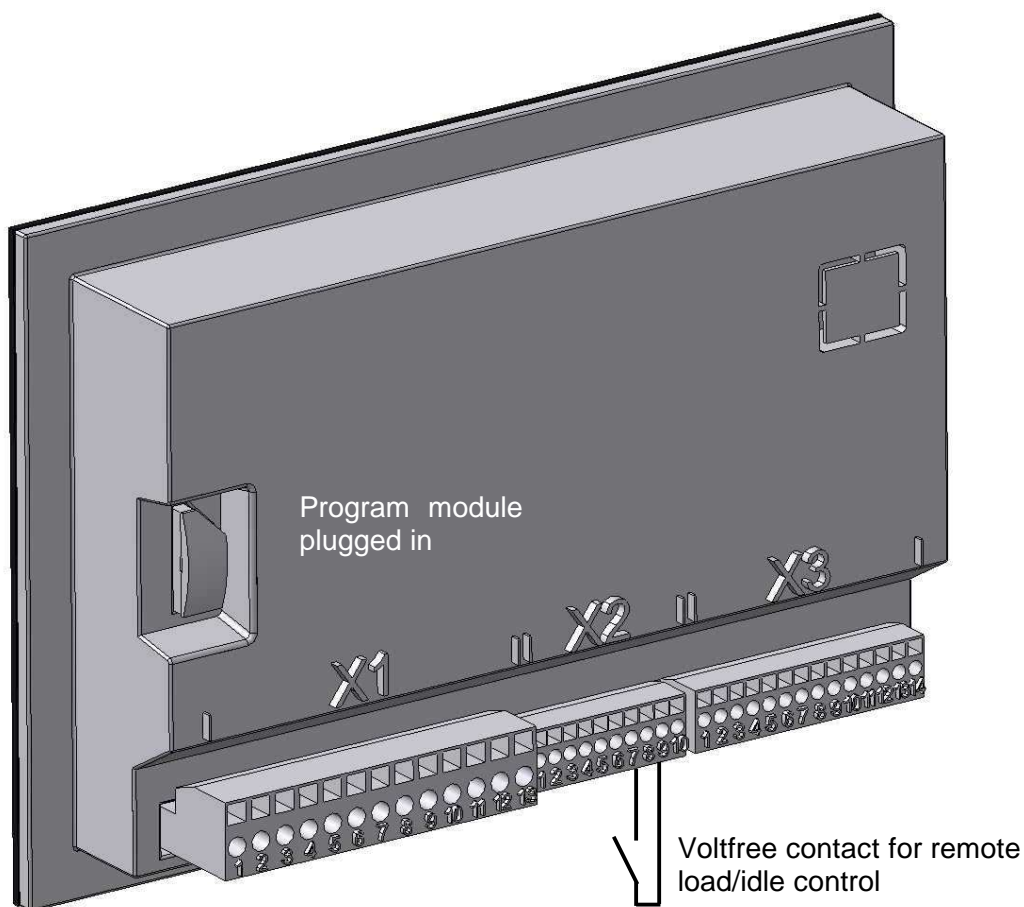
3.4 Entering the counter readings

Enter the readings as noted (see 3.1):

- parameter 0: operating hours
- parameter 1: hours under load
- parameter 2: hours to next service (interval)

3.5 Electrical connection

The connection of the volt-free contact for load/idle control is directly on the rear of the controller. Only flexible cable may be used with conductor section 0.5 - 1.5 mm² (AWG 22 - 16) - recommended cable is NYSLYÖ 2 x 1.0mm². Maximum cable length 100m.



Make connections as follows

- 1.) Connections should only be made by a qualified electrician, following local regulations. KAESER accepts no liability for damage caused by the retrofit.
- 2.) Holes must be drilled through the canopy near the power supply lines to provide entry for the cables. The cable entry must be equipped with appropriate cable fittings or grommets to exclude moisture and foreign bodies.
- 3.) The cable must be laid in such a way that no compressive or tensional stress is imposed on it when the switch cabinet door is opened.
- 4.) A screwdriver DIN5264 A 0.4 x 2.5 should be used to open the spring-loaded terminals. The screwdriver is inserted in the rectangular opening above the corresponding terminal. Strip 8 mm of insulation from the end of the conductor for insertion in the terminal.
- 5.) Make connection to pin 7 (input 14) and pin 9 (24V DC power supply) by means of X2 plug.
- 6.) Secure the cable so there is no tension on the X2 plug.

4. Removing the program module

1. The program module may not be removed from the controller.
2. Without the module there is no program in the controller.
The compressor will not run and the controller displays the error message "SYSTEM ERROR, call service". When the module is inserted again the machine can operate.