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

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http://www.kaeser.com

KAESER KOMPRESSOREN

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1 Extract from Service Manual

1.1 Keys and Indicators

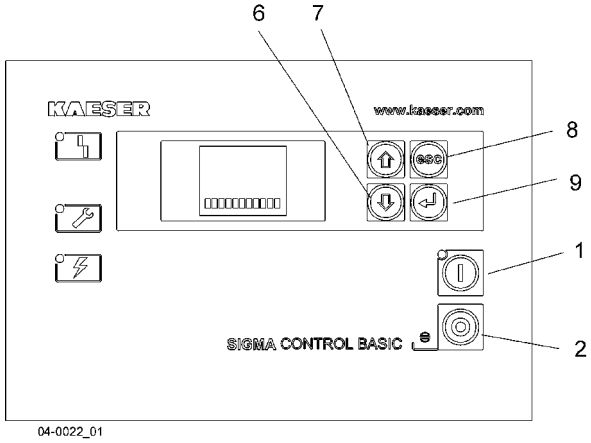

Fig. 1 Keys

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.
esc	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

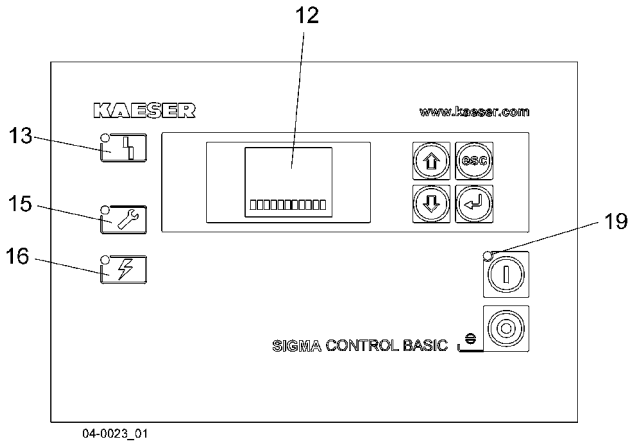

Fig. 2 Indicators

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 airend discharge 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 airend 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 airend 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 airend 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) < = Ie< = 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

Manufacturer: KAESER KOMPRESSOREN GmbH
96450 Coburg
GERMANY

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.

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

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,-1X31,-2X31		KASK.B-02010.00	2	
15	Component layout	Mounting plate		AASK.B-02010.00	1	

c				Datum	11.03.2004		KAESER KOMPRESSOREN	List of contents Compressor series ASK	=
b				Bearb.	Sitter				+
a				Gepr.	Büchner				
B	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung:		ZASK.B-02010.00 Blatt 1 Bl.

general instructions

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.

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

option T2 = transformer power supply for refrigeration dryer
option T3 = option refrigeration dryer

electrical equipment identification

general components

-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

option T3 - refrigeration dryer

-A04	Condensate drain
-K8M	Motor contactor
-M11	Compressor motor
-M12	Fan motor
-Q12	Overload protection switch
-T2	Transformer

terminal strips/plug-in connections

-X0	Terminal strip, Power supply
-X11	Terminal strip, Control
-X31	Terminal strip refrigeration dryer, option T3
-1X31,-2X31	Connector plug refrigeration dryer, option T3

Fault indicator

Shutdown function and Indicating function:

-B2	Direction of rotation pressure switch
-B11	Temperature probe, Airend discharge temperature
-B30	Safety pressure switch, option T3
-F2	Overload protection Compressor motor
-S3	EMERGENCY STOP pushbutton

Indicating function:

-B1	Pressure transducer, Air main pressure

c				Datum	11.03.2004		KAESER KOMPRESSOREN	Block diagram Compressor series ASK	=
b				Bearb.	Sitter				+
a				Gepr.	Büchner				
C	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung:	UASK.B-02010.00	Blatt 1 Bl.

performance-related components
ASK 27 / ASK 27 T

model

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	7.3140.02090	7.3140.02090	7.3140.02080	7.3140.02080	7.3140.02080
Siemens		3RV1935-5A	3RV1935-5A	3RV1915-5A	3RV1915-5A	3RV1915-5A
terminal strips	-X11	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland
	-X11/-X31	7.6836.00010 Wieland	7.6836.00010 Wieland	7.6836.00010 Wieland	7.6836.00010 Wieland	7.6836.00010 Wieland
Contactor	-K1M	7.6868.0	7.6868.0	7.6866.0	7.6866.0	7.6866.0
		3RT1035-1AL20	3RT1035-1AL20	3RT1026-1AL20	3RT1026-1AL20	3RT1026-1AL20
Auxiliary switch		2x 7.3140.01690	2x 7.3140.01690	2x 7.3140.01690	2x 7.3140.01690	2x 7.3140.01690
		3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10
Interference suppressor		7.3140.00920	7.3140.00920	7.3140.01400	7.3140.01400	7.3140.01400
Siemens		3RT1936-1CD00	3RT1936-1CD00	3RT1926-1CD00	3RT1926-1CD00	3RT1926-1CD00
Contactor	-K2M	7.6868.0	7.6868.0	7.6866.0	7.6866.0	7.6866.0
		3RT1035-1AL20	3RT1035-1AL20	3RT1026-1AL20	3RT1026-1AL20	3RT1026-1AL20
Auxiliary switch		7.3140.02030	7.3140.02030	7.3140.02030	7.3140.02030	7.3140.02030
		3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01
Interference suppressor		7.3140.00920	7.3140.00920	7.3140.01400	7.3140.01400	7.3140.01400
Siemens		3RT1936-1CD00	3RT1936-1CD00	3RT1926-1CD00	3RT1926-1CD00	3RT1926-1CD00
Contactor	-K3M	7.6866.0	7.6866.0	7.6865.0	7.6865.0	7.6865.0
		3RT1026-1AL20	3RT1026-1AL20	3RT1025-1AL20	3RT1025-1AL20	3RT1025-1AL20
Auxiliary switch		7.3140.01690	7.3140.01690	7.3140.01690	7.3140.01690	7.3140.01690
		3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10
Auxiliary switch		7.3140.02030	7.3140.02030	7.3140.02030	7.3140.02030	7.3140.02030
		3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01
Interference suppressor		7.3140.01400	7.3140.01400	7.3140.01400	7.3140.01400	7.3140.01400
Siemens		3RT1926-1CD00	3RT1926-1CD00	3RT1926-1CD00	3RT1926-1CD00	3RT1926-1CD00
Contactor	-K8M	7.6874.0	7.6874.0	7.6874.0	7.6874.0	7.6874.0
		3RT1016-1AP01	3RT1016-1AP01	3RT1016-1AP01	3RT1016-1AP01	3RT1016-1AP01
Interference suppressor		7.3140.01790	7.3140.01790	7.3140.01790	7.3140.01790	7.3140.01790
Siemens		3RT1916-1CD00	3RT1916-1CD00	3RT1916-1CD00	3RT1916-1CD00	3RT1916-1CD00
Overload protection	-F2	7.6873.00030	7.6873.00030	7.6873.00020	7.6873.00020	7.6873.00020
		3RB1036-1UB0	3RB1036-1UB0	3RB1026-1QB0	3RB1026-1QB0	3RB1026-1QB0
Siemens		13-50 A	13-50 A	6-25 A	6-25 A	6-25 A
Overload protection switch	-Q0	7.6860.00090	7.6860.00090	7.6860.00090	7.6860.00090	7.6860.00090
		3RV1011-0JA10	3RV1011-0JA10	3RV1011-0JA10	3RV1011-0JA10	3RV1011-0JA10
		0,7-1 A	0,7-1 A	0,7-1 A	0,7-1 A	0,7-1 A
Siemens		setting: 0,9 A	setting: 0,77 A	setting: 0,77 A	setting: 0,77 A	setting: 0,77 A
Overload protection switch	-Q12	7.6860.00190	7.6860.00190	7.6860.00160	7.6860.00160	7.6860.00160
(ASK 27 T)		3RV1011-1JA10	3RV1011-1JA10	3RV1011-1FA10	3RV1011-1FA10	3RV1011-1FA10
		7-10 A	7-10 A	3,5-5 A	3,5-5 A	3,5-5 A
		setting: 8,1 A	setting: 7,0 A	setting: 4,3 A	setting: 3,7 A	setting: 3,7 A
Auxiliary switch		7.3140.01890	7.3140.01890	7.3140.01890	7.3140.01890	7.3140.01890
Siemens		3RV1901-1E	3RV1901-1E	3RV1901-1E	3RV1901-1E	3RV1901-1E
Transformer	-T1	7.0776.10040	7.0776.10040	7.0775.2	7.0775.2	7.0776.10040
		9916497 Eltra	9916497 Eltra	B0001089 Block	B0001089 Block	9916497 Eltra
		160 VA	160 VA	160 VA	160 VA	160 VA
		diagram 2, Sht. 6	diagram 2, Sht. 6	diagram 1, Sht. 6	diagram 1, Sht. 6	diagram 2, Sht. 6
Transformer	-T2	7.2292.10060	---	7.2292.10060	7.3717.00240	7.2292.10060
(ASK 27 T)		USTE1600 Block		USTE1600 Block	B0312005 Block	USTE1600 Block
		7,0 A		7,0 A	400/230 V, 6,4 A	7,0 A
		diagram 11, Sht. 6		diagram 11, Sht. 6	diagram 10, Sht. 6	diagram 11, Sht. 6
Power supply	-G1	7.7025.1	7.7025.1	7.7025.1	7.7025.1	7.7025.1
Siemens		230VAC/24VDC 1,3A	230VAC/24VDC 1,3A	230VAC/24VDC 1,3A	230VAC/24VDC 1,3A	230VAC/24VDC 1,3A
connection	-W13	7.3140.02120	7.3140.02120	7.3140.02110	7.3140.02110	7.3140.02110
Siemens		3RV1935-1A	3RV1935-1A	3RT1926-4CC20	3RT1926-4CC20	3RT1926-4CC20
connection	-W14	H07V-K black	H07V-K black	7.3140.02130	7.3140.02130	7.3140.02130
		3x1x6 mm²	3x1x6 mm²	3RA1923-3D Siemens	3RA1923-3D Siemens	3RA1923-3D Siemens
cables	-W19.1/.2	YwSLYw-J 750 V	YwSLYw-J 750 V	YwSLYw-J 750 V	YwSLYw-J 750 V	YwSLYw-J 750 V
		2x4x10 mm²	2x4x10 mm²	2x4x4 mm²	2x4x4 mm²	2x4x4 mm²
Compressor control	-A10	7.7005.0	7.7005.0	7.7005.0	7.7005.0	7.7005.0
Siemens		SIGMA CONTROL BASIC	SIGMA CONTROL BASIC	SIGMA CONTROL BASIC	SIGMA CONTROL BASIC	SIGMA CONTROL BASIC
EMERGENCY STOP pushbutton	-S3	7.3217.0	7.3217.0	7.3217.0	7.3217.0	7.3217.0
		QRUV	QRUV	QRUV	QRUV	QRUV
Switching element		7.3218.0	7.3218.0	7.3218.0	7.3218.0	7.3218.0
Schlegel		MHT00	MHT00	MHT00	MHT00	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

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Blatt 2 Bl.

UASK.B-02010.00

Block diagram
Compressor series ASK

KAESER KOMPRESSOREN

Ursprung:
Ersatz für:
Ersatz durch:

	Datum	Name
	11.03.2004	
Bearb.	Sifter	
Gepr.	Büchner	
Norm		
Datum		

c Änderung
b
a

performance-related components
ASK 32 / ASK 32 T

model

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	7.3140.02090	7.3140.02090	7.3140.02080	7.3140.02080	7.3140.02090
	Siemens	3RV1935-5A	3RV1935-5A	3RV1915-5A	3RV1915-5A	3RV1935-5A
terminal strips	-X11	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland	7.6836.0 Wieland
	-X11/-X31	7.6836.00010 Wieland	7.6836.00010 Wieland	7.6836.00010 Wieland	7.6836.00010 Wieland	7.6836.00010 Wieland
Contactor	-K1M	7.6869.0	7.6869.0	7.6866.0	7.6866.0	7.6867.0
		3RT1036-1AL20	3RT1036-1AL20	3RT1026-1AL20	3RT1026-1AL20	3RT1034-1AL20
Auxiliary switch		2x 7.3140.01690	2x 7.3140.01690	2x 7.3140.01690	2x 7.3140.01690	2x 7.3140.01690
		3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10
Interference suppressor		7.3140.00920	7.3140.00920	7.3140.01400	7.3140.01400	7.3140.00920
	Siemens	3RT1936-1CD00	3RT1936-1CD00	3RT1926-1CD00	3RT1926-1CD00	3RT1936-1CD00
Contactor	-K2M	7.6869.0	7.6869.0	7.6866.0	7.6866.0	7.6867.0
		3RT1036-1AL20	3RT1036-1AL20	3RT1026-1AL20	3RT1026-1AL20	3RT1034-1AL20
Auxiliary switch		7.3140.02030	7.3140.02030	7.3140.02030	7.3140.02030	7.3140.02030
		3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01
Interference suppressor		7.3140.00920	7.3140.00920	7.3140.01400	7.3140.01400	7.3140.00920
	Siemens	3RT1936-1CD00	3RT1936-1CD00	3RT1926-1CD00	3RT1926-1CD00	3RT1936-1CD00
Contactor	-K3M	7.6867.0	7.6867.0	7.6865.0	7.6865.0	7.6865.0
		3RT1034-1AL20	3RT1034-1AL20	3RT1025-1AL20	3RT1025-1AL20	3RT1025-1AL20
Auxiliary switch		7.3140.01690	7.3140.01690	7.3140.01690	7.3140.01690	7.3140.01690
		3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10
Auxiliary switch		7.3140.02030	7.3140.02030	7.3140.02030	7.3140.02030	7.3140.02030
		3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01
Interference suppressor		7.3140.00920	7.3140.00920	7.3140.01400	7.3140.01400	7.3140.01400
	Siemens	3RT1936-1CD00	3RT1936-1CD00	3RT1926-1CD00	3RT1926-1CD00	3RT1926-1CD00
Contactor	-K8M	7.6874.0	7.6874.0	7.6874.0	7.6874.0	7.6874.0
		3RT1016-1AP01	3RT1016-1AP01	3RT1016-1AP01	3RT1016-1AP01	3RT1016-1AP01
Interference suppressor		7.3140.01790	7.3140.01790	7.3140.01790	7.3140.01790	7.3140.01790
	Siemens	3RT1916-1CD00	3RT1916-1CD00	3RT1916-1CD00	3RT1916-1CD00	3RT1916-1CD00
Overload protection	-F2	7.6873.00030	7.6873.00030	7.6873.00020	7.6873.00020	7.6873.00030
		3RB1036-1UB0	3RB1036-1UB0	3RB1026-1QB0	3RB1026-1QB0	3RB1036-1UB0
	Siemens	13-50 A	13-50 A	6-25 A	6-25 A	13-50 A
Overload protection switch	-Q0	7.6860.00090	7.6860.00090	7.6860.00090	7.6860.00090	7.6860.00090
		3RV1011-0JA10	3RV1011-0JA10	3RV1011-0JA10	3RV1011-0JA10	3RV1011-0JA10
		0,7-1 A	0,7-1 A	0,7-1 A	0,7-1 A	0,7-1 A
	Siemens	setting: 0,9 A	setting: 0,77 A	setting: 0,77 A	setting: 0,77 A	setting: 0,77 A
Overload protection switch	-Q12	7.6860.00190	7.6860.00190	7.6860.00160	7.6860.00160	7.6860.00160
	(ASK 32 T)	3RV1011-1JA10	3RV1011-1JA10	3RV1011-1FA10	3RV1011-1FA10	3RV1011-1FA10
		7-10 A	7-10 A	3,5-5 A	3,5-5 A	3,5-5 A
		setting: 8,1 A	setting: 7,0 A	setting: 4,3 A	setting: 3,7 A	setting: 3,7 A
Auxiliary switch		7.3140.01890	7.3140.01890	7.3140.01890	7.3140.01890	7.3140.01890
	Siemens	3RV1901-1E	3RV1901-1E	3RV1901-1E	3RV1901-1E	3RV1901-1E
Transformer	-T1	7.0776.10040	7.0776.10040	7.0775.2	7.0775.2	7.0776.10040
		9916497 Eltra	9916497 Eltra	B0001089 Block	B0001089 Block	9916497 Eltra
		160 VA	160 VA	160 VA	160 VA	160 VA
		diagram 2, Sht. 6	diagram 2, Sht. 6	diagram 1, Sht. 6	diagram 1, Sht. 6	diagram 2, Sht. 6
Transformer	-T2	7.2292.10060	---	7.2292.10060	7.3717.00240	7.2292.10060
	(ASK 32 T)	USTE1600 Block		USTE1600 Block	B0312005 Block	USTE1600 Block
		7,0 A		7,0 A	400/230 V, 6,4 A	7,0 A
	Block	diagram 11, Sht. 6		diagram 11, Sht. 6	diagram 10, Sht. 6	diagram 11, Sht. 6
Power supply	-G1	7.7025.1	7.7025.1	7.7025.1	7.7025.1	7.7025.1
	Siemens	230VAC/24VDC 1,3A	230VAC/24VDC 1,3A	230VAC/24VDC 1,3A	230VAC/24VDC 1,3A	230VAC/24VDC 1,3A
connection	-W13	7.3140.02120	7.3140.02120	7.3140.02110	7.3140.02110	7.3140.02110
	Siemens	3RV1935-1A	3RV1935-1A	3RT1926-4CC20	3RT1926-4CC20	3RT1926-4CC20
connection	-W14	7.3140.02120	7.3140.02120	7.3140.02130	7.3140.02130	H07V-K black
		3RV1935-1A Siemens	3RV1935-1A Siemens	3RA1923-3D Siemens	3RA1923-3D Siemens	3x1x6 mm²
cables	-W19.1/.2	YwSLYw-J 750 V	YwSLYw-J 750 V	YwSLYw-J 750 V	YwSLYw-J 750 V	YwSLYw-J 750 V
		2x4x16 mm²	2x4x10 mm²	2x4x6 mm²	2x4x4 mm²	2x4x4 mm²
Compressor control	-A10	7.7005.0	7.7005.0	7.7005.0	7.7005.0	7.7005.0
	Siemens	SIGMA CONTROL BASIC	SIGMA CONTROL BASIC	SIGMA CONTROL BASIC	SIGMA CONTROL BASIC	SIGMA CONTROL BASIC
EMERGENCY STOP pushbutton	-S3	7.3217.0	7.3217.0	7.3217.0	7.3217.0	7.3217.0
		QRUV	QRUV	QRUV	QRUV	QRUV
Switching element		7.3218.0	7.3218.0	7.3218.0	7.3218.0	7.3218.0
	Schlegel	MHT00	MHT00	MHT00	MHT00	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

UASK.B-02010.00

Blatt 3 Bl.

Block diagram
Compressor series ASK

KAESER KOMPRESSOREN

Ursprung:
Ersatz für:
Ersatz durch:

	Datum	Name
Bearb.	11.03.2004	
Gepr.	Sifter	
Norm	Büchner	
Datum		
Name		
Datum		

c Änderung
b
a

performance-related components
ASK 35

model

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	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	3x 7.3140.02100	7.3140.02090	7.3140.02090	7.3140.02090	7.3140.02090
Siemens	3RA1943-3L	3RV1935-5A	3RV1935-5A	3RV1935-5A	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	7.6869.0	7.6867.0	7.6867.0	7.6867.0
	3RT1044-1AL20	3RT1036-1AL20	3RT1034-1AL20	3RT1034-1AL20	3RT1034-1AL20
Auxiliary switch	7.3140.02230	2x 7.3140.01690	2x 7.3140.01690	2x 7.3140.01690	2x 7.3140.01690
	3RH1921-1XA20-0PA0	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10
Interference suppressor	7.3140.00920	7.3140.00920	7.3140.00920	7.3140.00920	7.3140.00920
Siemens	3RT1936-1CD00	3RT1936-1CD00	3RT1936-1CD00	3RT1936-1CD00	3RT1936-1CD00
Contactor -K2M	7.6870.0	7.6869.0	7.6867.0	7.6867.0	7.6867.0
	3RT1044-1AL20	3RT1036-1AL20	3RT1034-1AL20	3RT1034-1AL20	3RT1034-1AL20
Auxiliary switch	7.3140.02200	7.3140.02030	7.3140.02030	7.3140.02030	7.3140.02030
	3RH1921-1DA11	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01
Interference suppressor	7.3140.00920	7.3140.00920	7.3140.00920	7.3140.00920	7.3140.00920
Siemens	3RT1936-1CD00	3RT1936-1CD00	3RT1936-1CD00	3RT1936-1CD00	3RT1936-1CD00
Contactor -K3M	7.6867.0	7.6867.0	7.6865.0	7.6865.0	7.6865.0
	3RT1034-1AL20	3RT1034-1AL20	3RT1025-1AL20	3RT1025-1AL20	3RT1025-1AL20
Auxiliary switch	7.3140.01690	7.3140.01690	7.3140.01690	7.3140.01690	7.3140.01690
	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10	3RH1921-1CA10
Auxiliary switch	7.3140.02030	7.3140.02030	7.3140.02030	7.3140.02030	7.3140.02030
	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01	3RH1921-1CA01
Interference suppressor	7.3140.00920	7.3140.00920	7.3140.01400	7.3140.01400	7.3140.01400
Siemens	3RT1936-1CD00	3RT1936-1CD00	3RT1926-1CD00	3RT1926-1CD00	3RT1926-1CD00
Overload protection -F2	7.6873.00040	7.6873.00030	7.6873.00030	7.6873.00030	7.6873.00030
	3RB1046-1UB0	3RB1036-1UB0	3RB1036-1UB0	3RB1036-1UB0	3RB1036-1UB0
Siemens	13-50 A	13-50 A	13-50 A	13-50 A	13-50 A
Overload protection switch -Q0	7.6860.00090	7.6860.00090	7.6860.00090	7.6860.00090	7.6860.00090
	3RV1011-0JA10	3RV1011-0JA10	3RV1011-0JA10	3RV1011-0JA10	3RV1011-0JA10
	0,7-1 A	0,7-1 A	0,7-1 A	0,7-1 A	0,7-1 A
Siemens	setting: 0,9 A	setting: 0,77 A	setting: 0,77 A	setting: 0,77 A	setting: 0,77 A
Transformer -T1	7.0776.10040	7.0776.10040	7.0775.2	7.0775.2	7.0776.10040
	9916497 Eltra	9916497 Eltra	B0001089 Block	B0001089 Block	9916497 Eltra
	160 VA	160 VA	160 VA	160 VA	160 VA
	diagram 2, Sht. 6	diagram 2, Sht. 6	diagram 1, Sht. 6	diagram 1, Sht. 6	diagram 2, Sht. 6
Power supply -G1	7.7025.1	7.7025.1	7.7025.1	7.7025.1	7.7025.1
Siemens	230VAC/24VDC 1,3A	230VAC/24VDC 1,3A	230VAC/24VDC 1,3A	230VAC/24VDC 1,3A	230VAC/24VDC 1,3A
connection -W13	H07V-K black	7.3140.02120	7.3140.02120	7.3140.02120	7.3140.02120
Siemens	3x1x16 mm²	3RV1935-1A	3RV1935-1A	3RV1935-1A	3RV1935-1A
connection -W14	H07V-K black	7.3140.02120	H07V-K black	H07V-K black	H07V-K black
	3x1x16 mm²	3RV1935-1A Siemens	3x1x6 mm²	3x1x6 mm²	3x1x6 mm²
cables -W19.1/.2	YwSLYw-J 750 V	YwSLYw-J 750 V	YwSLYw-J 750 V	YwSLYw-J 750 V	YwSLYw-J 750 V
	2x4x16 mm²	2x4x16 mm²	2x4x6 mm²	2x4x6 mm²	2x4x4 mm²
Compressor control -A10	7.7005.0	7.7005.0	7.7005.0	7.7005.0	7.7005.0
Siemens	SIGMA CONTROL BASIC	SIGMA CONTROL BASIC	SIGMA CONTROL BASIC	SIGMA CONTROL BASIC	SIGMA CONTROL BASIC
EMERGENCY STOP pushbutton -S3	7.3217.0	7.3217.0	7.3217.0	7.3217.0	7.3217.0
	QRUV	QRUV	QRUV	QRUV	QRUV
Switching element	7.3218.0	7.3218.0	7.3218.0	7.3218.0	7.3218.0
Schlegel	MHT00	MHT00	MHT00	MHT00	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 4 Bl.

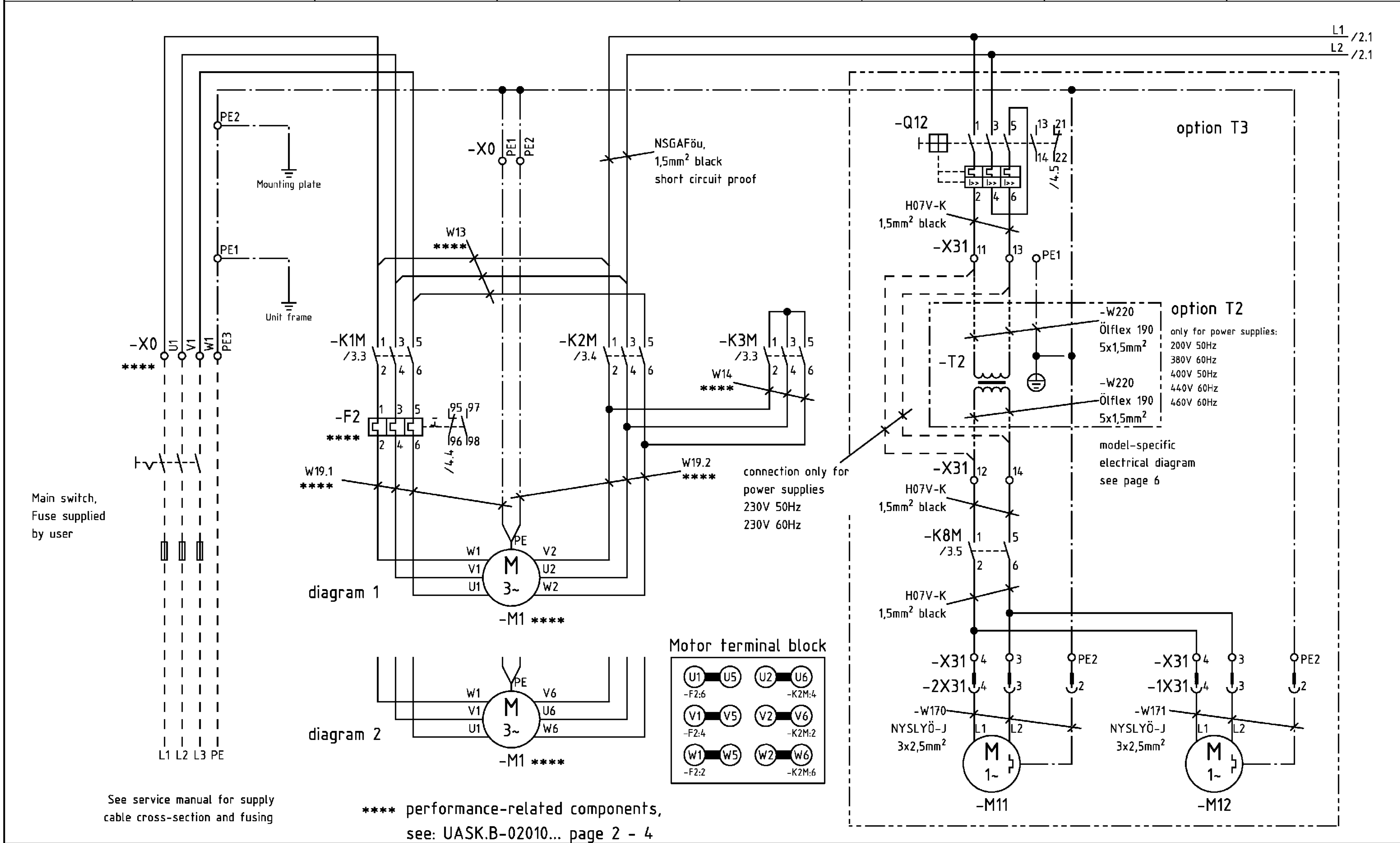
UASK.B-02010.00

Block diagram
Compressor series ASK

KAESER KOMPRESSOREN

Ursprung:
Ersatz für:
Ersatz durch:

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



Function:	Compressor motor	Compressor motor	Fan motor
Group of functions: Main power supply	Power switching	Power switching Dryer	

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

Ersatz durch: | Ersatz für: | Ursprung:

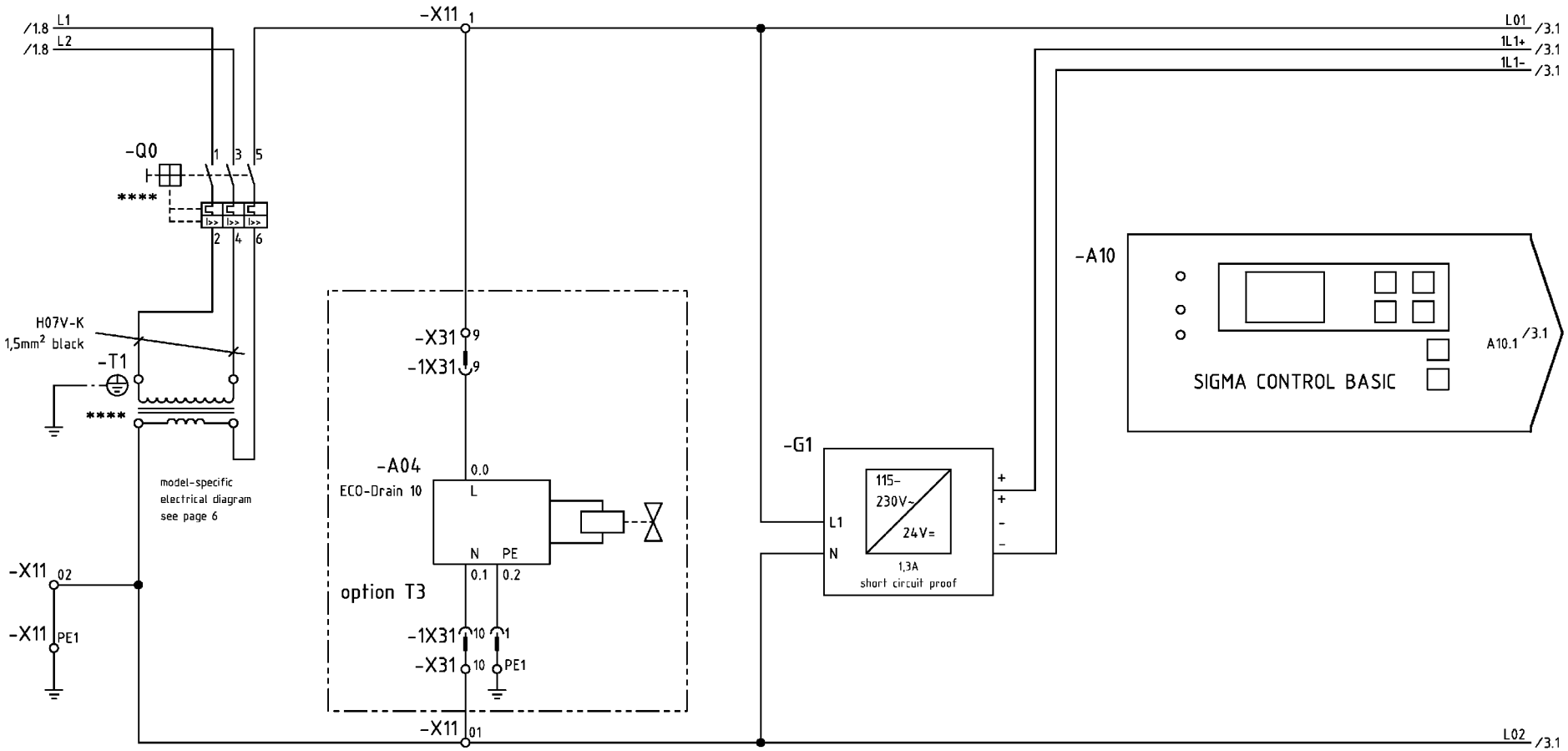
KAESER
KOMPRESSOREN

Circuit diagram
Compressor series ASK
Power switching

=
+

SASK.B-02010.00

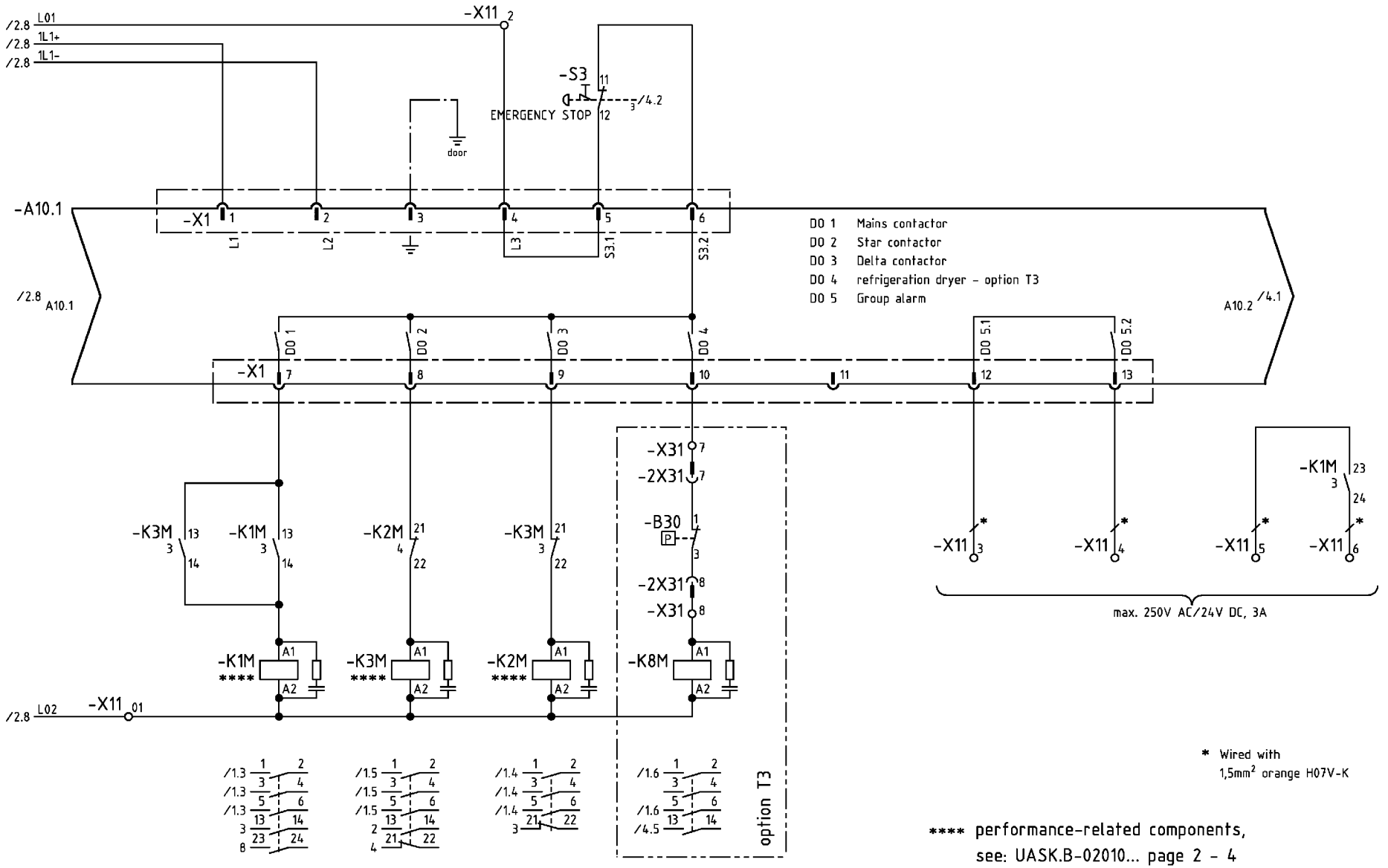
Blatt 1
Bl.



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

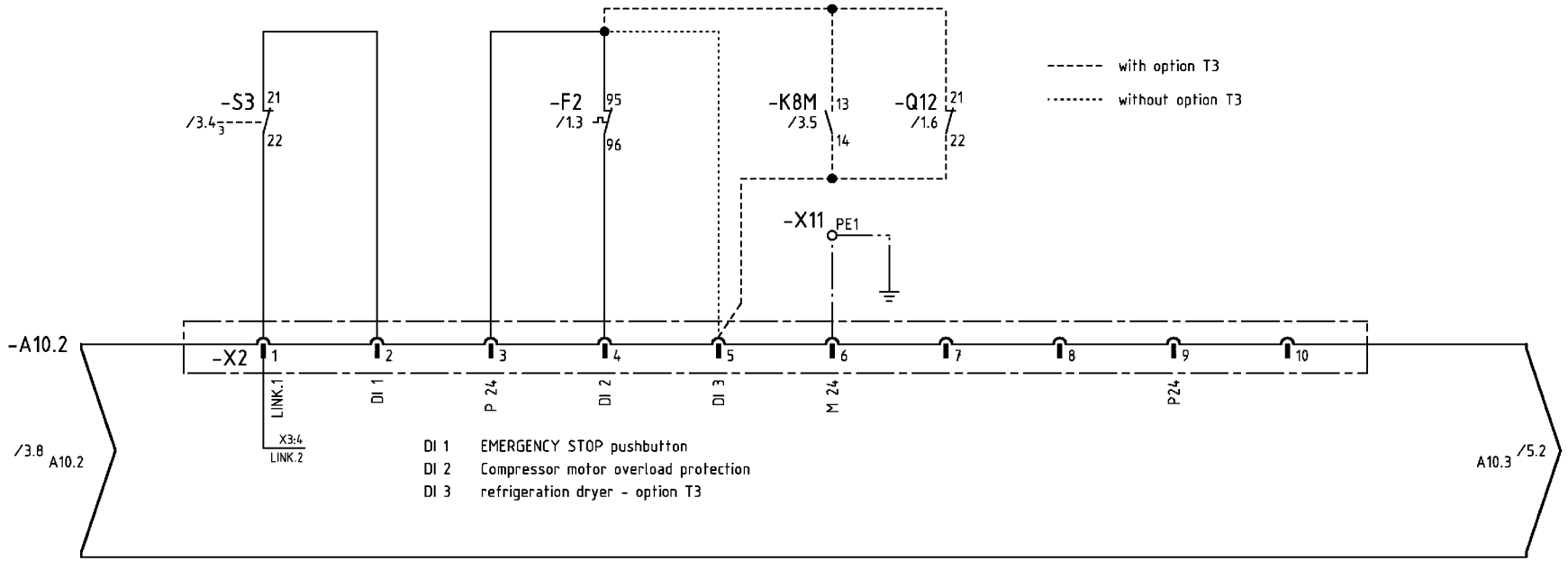
Function: 230V/1~/50/60Hz	Automatic condensate drain	24V DC	
Group of functions: Control voltage tapping	refrigeration dryer	Control voltage tapping	

c				Datum	11.03.2004	KAESER KOMPRESSOREN	Circuit diagram Compressor series ASK Control voltage tapping	=
b				Bearb.	Sitter			+
a				Gepr.	Büchner			
D	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für: / Ursprung:		SASK.B-02010.00 Blatt 2 Bl.



Function:		Group alarm	motor running
Group of functions:	Star-delta changeover	refrigeration dryer	Volt-free contacts

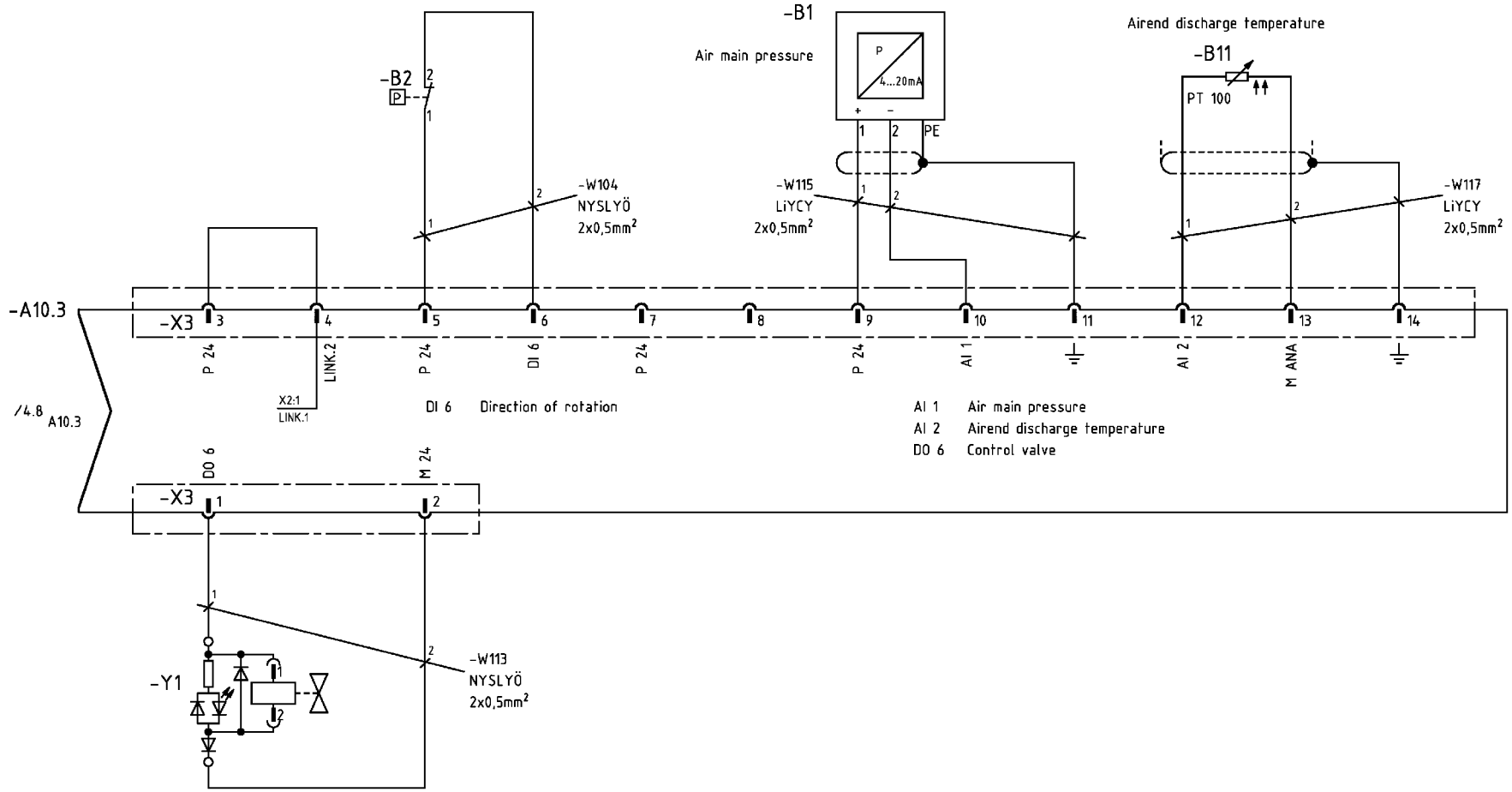
c				Datum	11.03.2004		KAESER KOMPRESSOREN	Circuit diagram Compressor series ASK supply/Relay-outputs	=
b				Bearb.	Sitter				+
a				Gepr.	Büchner				
D	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung:	SASK.B-02010.00	Blatt 3 Bl.



Function:

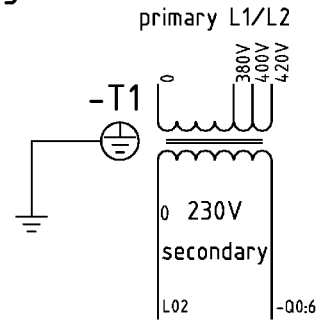
Group of functions:

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



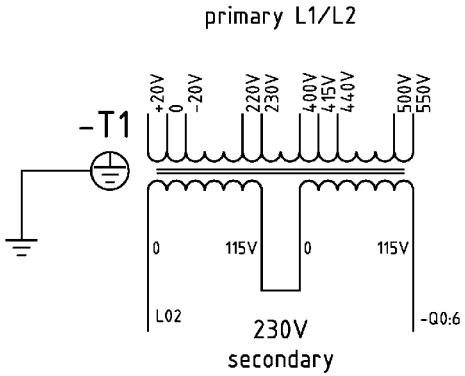
Function:	Inlet/ Venting								
Group of functions:									
c				Datum	11.03.2004		KAESER KOMPRESSOREN	Circuit diagram Compressor series ASK inputs/outputs external	=
b				Bearb.	Sitter				+
a				Gepr.	Büchner				
D	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung:	SASK.B-02010.00	Blatt 5 Bl.

diagram 1



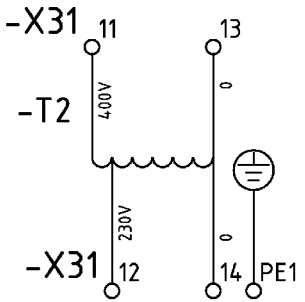
primary	Power connection	
	L1	L2
420V	0	420V
400V	0	400V
380V	0	380V

diagram 2



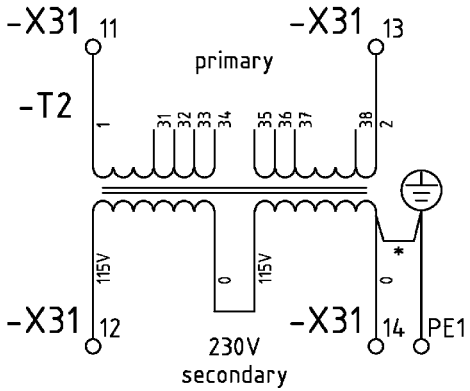
primary	Power connection	
	L1	L2
460V	+20V	440V
440V	0	440V
230V	0	230V
200V	-20V	220V

diagram 10



primary	Power connection	
	L1	L2
400V	0	400V

diagram 11

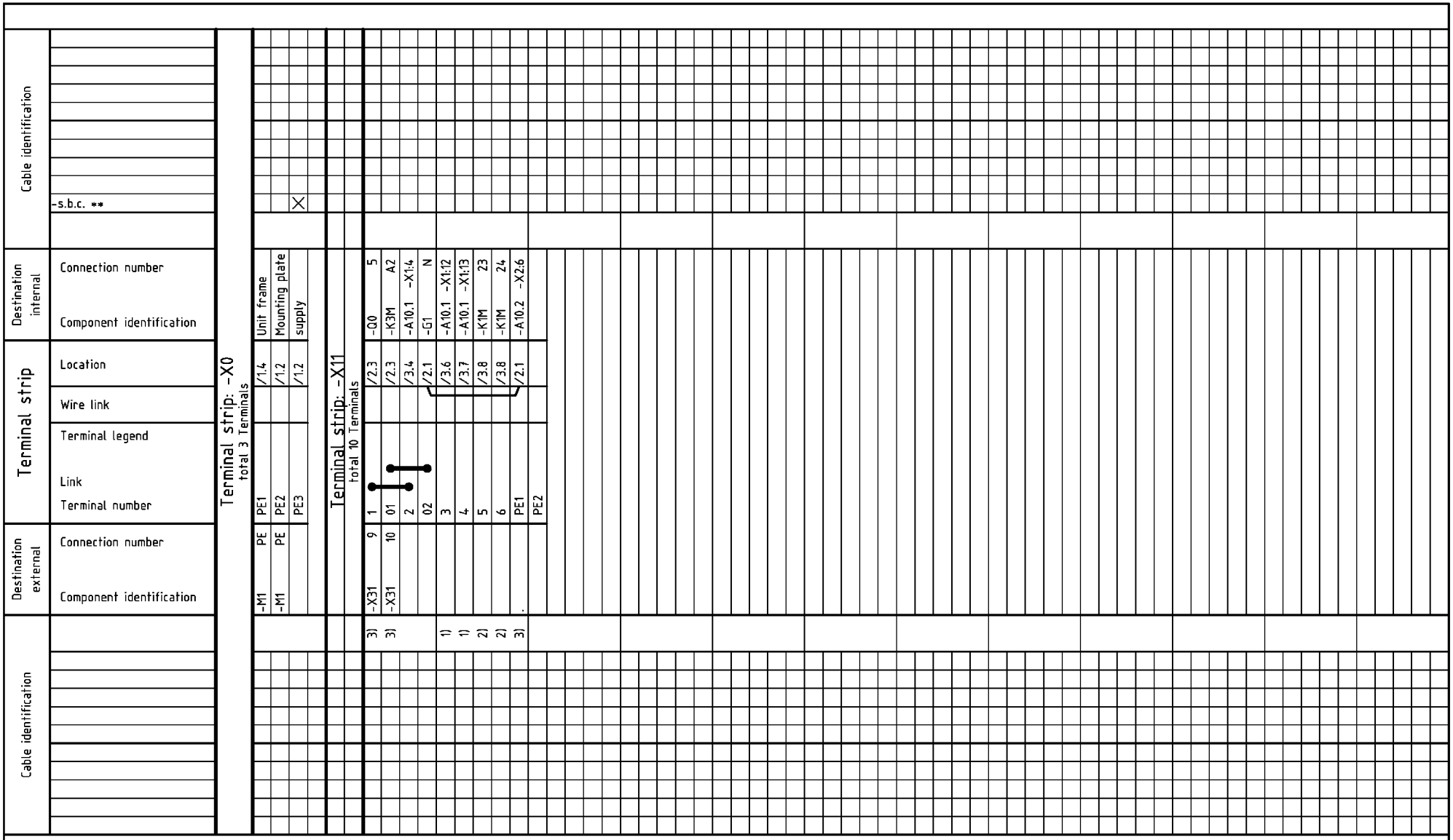


Power connection 1-2	
primary	Jumper between:
460V	32-36
440V	32-37
380V	31-38
200V	1-37/2-31

*** ATTENTION !!!**

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

c				Datum	11.03.2004		KAESER KOMPRESSOREN	Circuit diagram Compressor series ASK transformer diagrams	=
b				Bearb.	Sitter				+
a				Gepr.	Büchner				
D	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung:	SASK.B-02010.00	Blatt 6 Bl.



** See service manual for supply cable cross-section

s.b.c. = supplied by customer

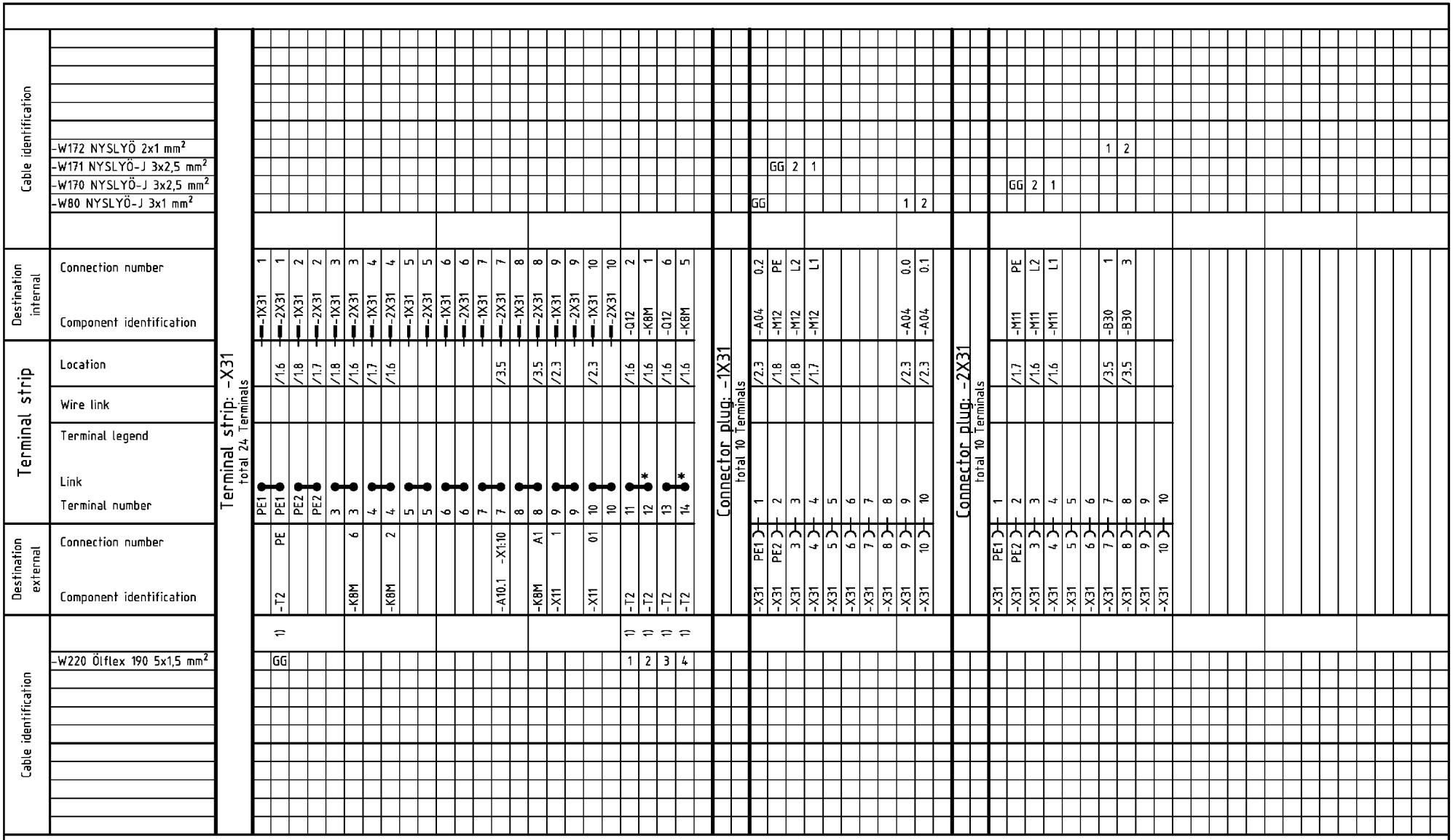
Volt-free contacts, User's connection

1) Group alarm

2) motor running

3) option T3

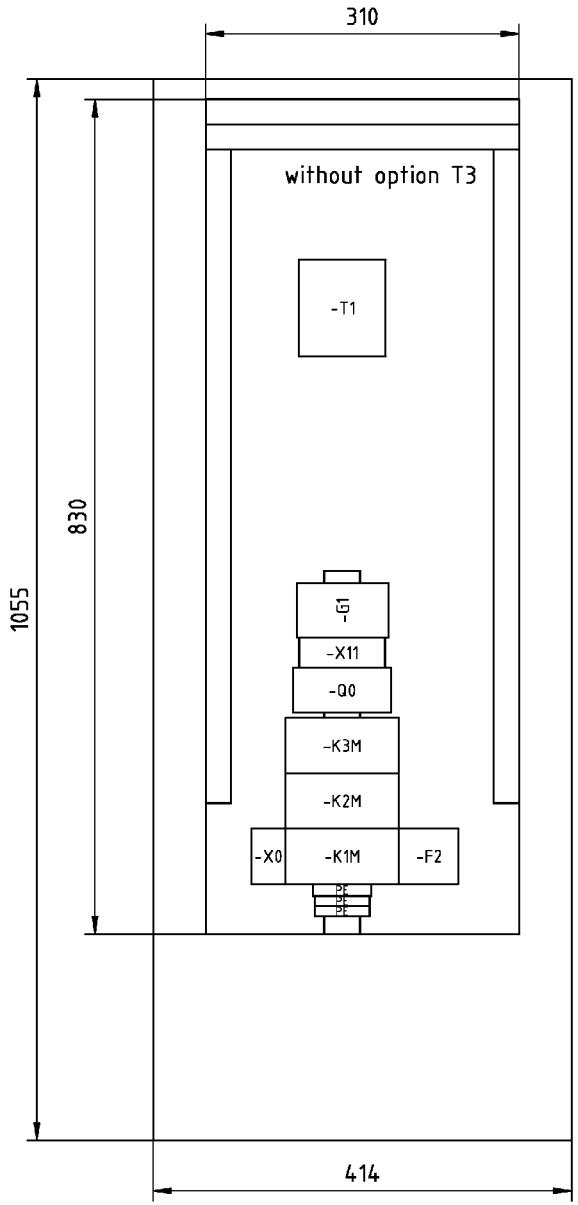
c				Datum	11.03.2004	KAESER KOMPRESSOREN	Terminal schedule	=	
b				Bearb.	Sitter		Compressor series ASK	+	
a				Gepr.	Büchner		Terminal strip -X0,-X11	KASK.B-02010.00	Blatt 1
H	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für: / Ursprung:			Bl.

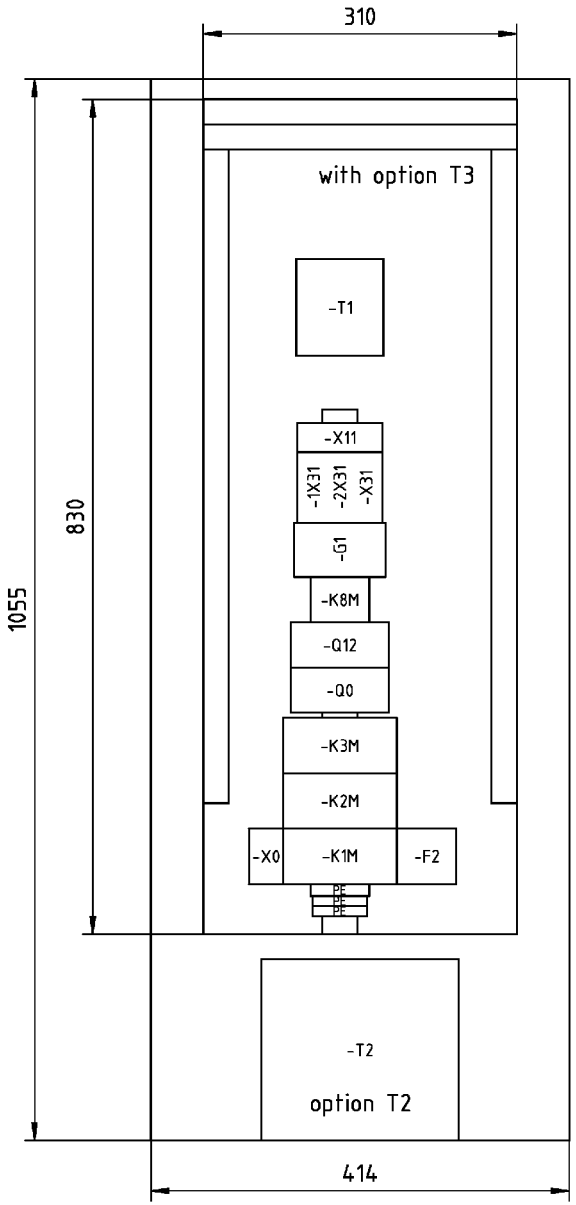


1) option T2
only for power supplies, 200V 50Hz, 380V 60Hz
400V 50Hz, 440V 60Hz, 460V 60Hz

* connection only for
power supplies 230V 50Hz, 230V 60Hz

c				Datum	11.03.2004	KAESER KOMPRESSOREN	Terminal schedule Compressor series ASK option T3/-X31,-1X31,-2X31	=	
b				Bearb.	Sitter			+	
a				Gepr.	Büchner				
H	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für: / Ursprung:		KASK.B-02010.00	Blatt 2 Bl.





The components are performance-related and not shown to scale.

c				Datum	11.03.2004		KAESER KOMPRESSOREN	Component layout	=
b				Bearb.	Sitter			Compressor series ASK	+
a				Gepr.	Büchner			Mounting plate	AASK.B-02010.00 Blatt 1
l	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: AAS02013_00		Bl.

4 Technical Description of the External Load-Idle Retrofit Kit

KAESER KOMPRESSOREN

Technical Description of

SIGMA CONTROL BASIC

Program module for remote load/idle control

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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.

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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

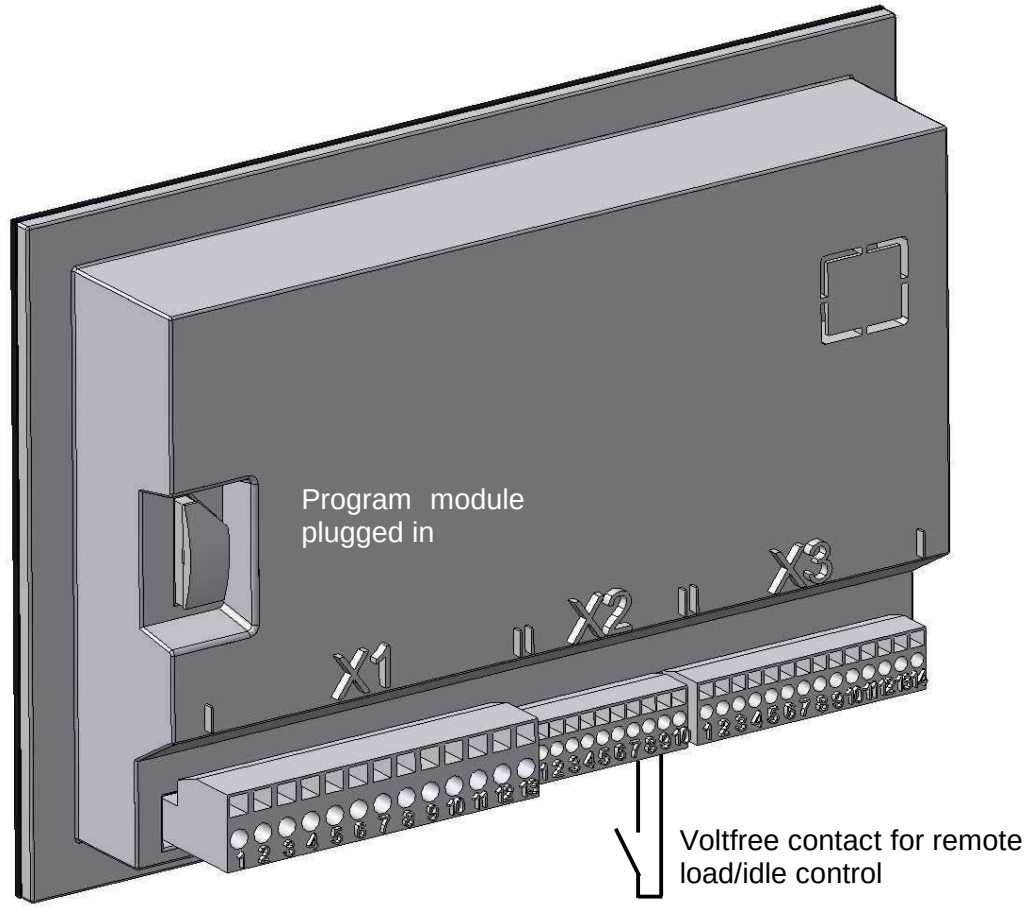
- Start the controller and allow it to boot up.
- Switch the controller off.
- Switch the controller on again. During booting up the display should show: *SBSxx.xx_**R***

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.