POWERSWITCH
Reversing Contactor
BH 9253

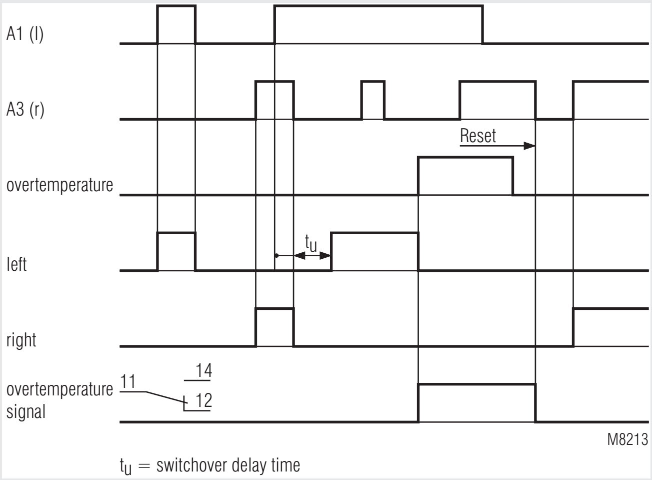
0238830

BH 9253 with
Rated continuous current 4 A

BH 9253 with
Rated continuous current 12 A

- According to IEC/EN 60 947-1, IEC/EN 60 947-4-2
- Switching at zero-crossing
- To reverse 3 phase asynchronuos motors up to 5.5 kW / 400 V (7.5 HP / 460 V)
- Electrical interlocking of both directions
- Temperature monitoring to protect the power semiconductors
- Measured nominal current up to 20 A
- LEDs for status indication
- Galvanic separation between control circuit and power circuit
- 45 mm; 67.5 mm; 112.5 mm width

Function Diagram



Approvals and Markings

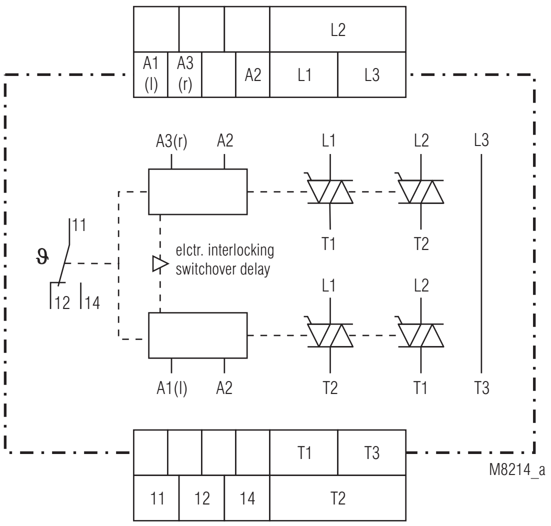
CE | c UL US LISTED Canada / USA

Function

The reversing contactor BH 9253 is used to reverse the direction of 3-phase asynchronuos motors by switching 2 phases. An electrical interlokking disables the control of both directions at the same time. The reversing contactor has a short on and off delay time. When reversing the phases a switchover delay is guaranteed.

Temperature sensing
To protect the power semiconductors the unit incorporates temperature monitoring. When overtemperature is detected the power semiconductors swith off and an output relay as well as a red LED is activated. This state is stored. When the temperature is back to normal the semiconductors can be activated again by switching off and on the control voltage.

Circuit Diagrams



Indicators

yellow LED "l":	on, when left direction active
yellow LED "r":	on, when right direction active
red LED:	on, when overtemperature

Connection Terminal

Terminal designation	Signal designation
A1 (l), A2	Auxiliary voltage, control anti-clockwise
A3 (r), A2	Auxiliary voltage, control clockwise
L1, L2, L3	Mains connection
T1, T2, T3	Motor connection
11, 12, 14	Contacts output relays, active when overtemperature

Technical Data

Input

Nominal voltage
A1,A2 / A3,A2: AC/DC 24 V;
AC 110 ... 127 V, AC 220 ... 240 V, AC 288V
AC 400 V (no UL-devices)
control voltage A1, A3 has to be connected to the same potential (see appl. example)
Voltage range: AC: 0.8 ... 1.1 U_N
DC: 0.8 ... 1.25 U_N
Nominal consumption
at AC 230 V: 4 VA, 0.8 W
at DC 24 V: 0.3 W
Nominal frequency: 50 / 60 Hz
Switch on delay: max. 30 ms
Switch off delay: typically 25 ms
Switch-over delay t_u: 100 ms (other values on request)
Permissible residual voltage: 30 % U_N

Load Output

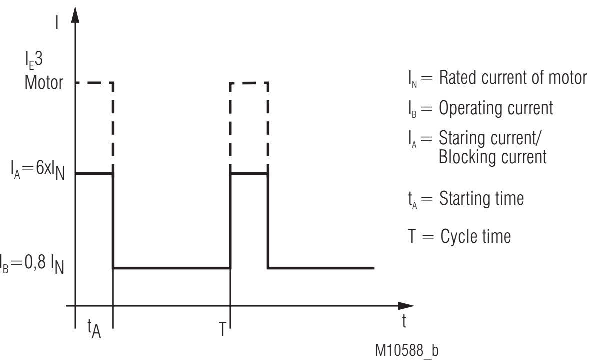
		unit without heat sink	with heat sink width 67.5 mm	with heat sink width 112.5 mm
Rated continuous current I_e [1)]	[A]	4	12	20
Current reduction above 40 °C	[A/°C]	0.1	0.2	0.2
max. motor power at 400 V	[kW]	1.1	4	5.5
Nominal motor current I_N	[A]	2.6	8.5	11.5
max. locked rotor motor current	[A]	15.6	51	69
Example for max. operat. freq. at 100 % duty cycle, 80 % motor load, starting time t_A 2s, starting current $I_A = 6 \times I_N$	[1/h]	250	210	320
Operation mode		AC53a acc. to IEC/EN 60947-4-2		

[1)] The rated continuous current I_e is the max. permissible current of the unit in continuous operation.

Note: The max. permissible operating frequency of the motor can be less. See motor data!

Load voltage range: AC 24 ... 480 V
Peak inverse voltage: 1 200 Vp
Frequency range: 50 / 60 Hz
Surge current 10 ms: 300 A
Semiconductor fuse: 450 A²s
Varistor voltage: AC 510 V

Cycle diagram to calculate the operating frequency



Formula for selection of unit and motor

$$I_e \overset{!}{\geq} \frac{1}{T}\left[I_A t_A + I_B (T-t_A)\right]$$ Device selection

$$I_N^2 \overset{!}{\geq} \frac{1}{T}\left[I_A^2 t_A + I_B^2 (T-t_A)\right]$$ Motor selection

I_A: Starting current / Blocking current
Please take into account the motor data.
Modern motors with efficiency class IE3 may have an inrush peek current of 10-12 times of the nominal motor current.

Technical Data

Monitoring Output

Contacts
BH 9253.11: 1 changeover contact
Thermal current I_{th}: 5 A
Switching capacity
at AC 15
NO: 3 A / AC 230 V IEC/EN 60 947-5-1
NC: 1 A / AC 230 V IEC/EN 60 947-5-1
Short circuit strength
max. fuse rating: 4 A gG / gL IEC/EN 60 947-5-1

General Data

Operating mode: Continuous operation
Temperature range
Operation: - 20 ... + 60 °C
Current reduction over 40 °C: see table
Storage: - 25 ... + 70 °C
Altitude: < 2,000 m
Clearance and creepage distances
rated impulse voltage / pollution degree: 4 kV / 2 IEC 60 664-1
EMC
Surge voltages: 5 kV / 0.5 J
HF-interference: 2.5 kV
Electrostatic discharge: 8 kV (air) IEC/EN 61 000-4-2
HF irradiation: 10 V / m IEC/EN 61 000-4-3
Fast transients: 4 kV IEC/EN 61 000-4-4
Surge voltages between wires for power supply: 1 kV IEC/EN 61 000-4-5
HF wire guided: 10 V IEC/EN 61 000-4-6
Interference suppression: Limit value class B EN 55 011
Degree of protection
Housing: IP 40 IEC/EN 60 529
Terminals: IP 20 IEC/EN 60 529
Housing: Thermoplastic with V0 behaviour according to UL subject 94
Vibration resistance: Amplitude 0.35 mm IEC/EN 60 068-2-6
frequency 10 ... 55 Hz
Climate resistance: 20 / 040 / 04 IEC/EN 60 068-1
Terminal designation: EN 50 005
Wire connection
Load terminals: 1 x 10 mm² solid or
1 x 6 mm² stranded ferruled
Control terminals: 2 x 2.5 mm² solid or
2 x 1.5 mm² stranded ferruled
DIN 46 228-1/-2/-3/-4
Wire fixing: terminal screws M3.5; box terminals with self-lifting wire protection
Fixing torque:
Load terminals: 1.2 Nm
Control terminals: 0.8 Nm
Mounting: DIN rail IEC/EN 60 715
Weight:
BH 9253 with 4 A: 420 g
BH 9253 with 12 A: 640 g
BH 9253 with 20 A: 1 040 g

Dimensions

Width x heigth x depth:
BH 9253 with 4 A: 45 x 84 x 121 mm
BH 9253 with 12 A: 67.5 x 84 x 121 mm
BH 9253 with 20 A: 112.5 x 84 x 121 mm

UL-Data

		unit without heat sink		with heat sink width 67.5 mm		with heat sink width 112.5 mm	
Switching capacity							
Relay							
NO-contact	[Vac]	230; 3A; GP					
NC-contact	[Vac]	230; 1A; GP					
Short circuit current rating	[Arms]	5000					
Ambient conditions		For usage at pollution degree 2; To be used in circuits that allows a max. curent of 5000Arms at 460 V. The device has to be fused with a fuse class RK5 25A.					
Rated continuous current I_e [1)]	[A]	4		12		20	
Ambient temperature	[°C]	40	60	40	60	40	60
max. motor power at 460 V	[HP]	1,5	0,75	5	3	7,5	5
Nominal motor current FLA (Full load current)	[A]	3,0	1,6	7,6	4,8	11	7,6
max. locked rotor motor current LRA	[A]	20	12,5	46	32	63,5	46

[1)] The rated continuous current I_e is the max. permissible current of the unit in continuous operation.

Wire connection
Load terminals
L1, L2, L3, T1, T2, T3: 60°C / 75°C copper conductors only
AWG 18 - 8 Sol Torque 0.8 Nm
AWG 18 - 10 Str Torque 0.8 Nm

Control terminals
A1, A2, A3, 11, 12, 14: 60°C / 75°C copper conductors only
AWG 20 - 12 Sol Torque 0.8 Nm
AWG 20 - 14 Str Torque 0.8 Nm

Info **Technical data that is not stated in the UL-Data, can be found in the technical data section.**

Standard Type

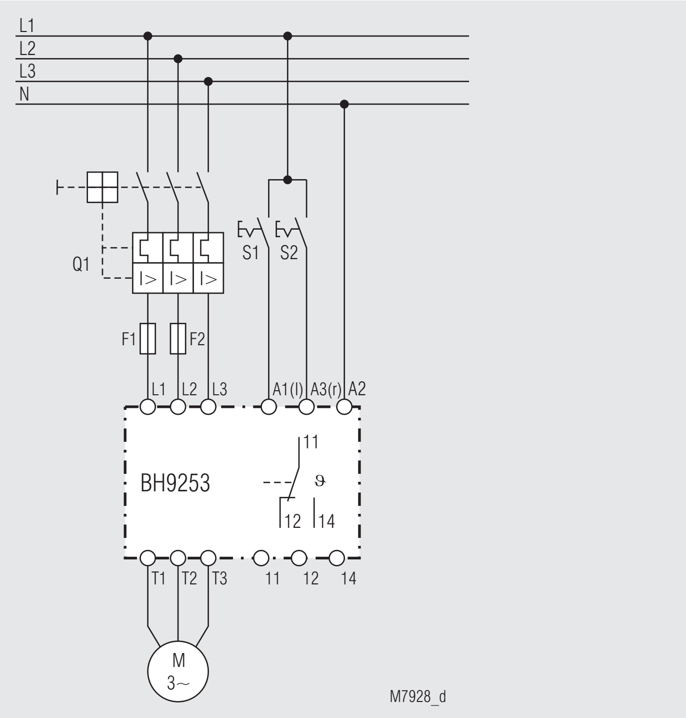
BH 9253.11/61 AC 220 ... 240 V 4 A 100 ms
Article number: 0064657
- Output: 1 changeover contact
- Nominal voltage U_N: AC 220 ... 240 V
- Rated continuous current: 4 A
- Switchover delay: 100 ms
- Width: 45 mm

Ordering Example

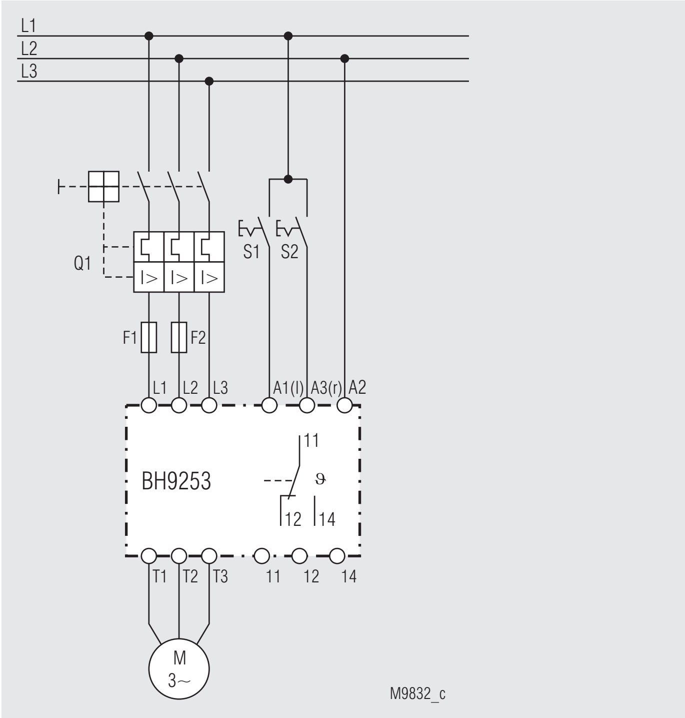
BH 9253 .11 /61 AC 220...240 V 4 A 100 ms

- 100 ms — Switchover delay
- 4 A — Rated continuous current
- AC 220...240 V — Nominal voltage
- /61 — UL approval
- .11 — Contacts
- BH 9253 — Type

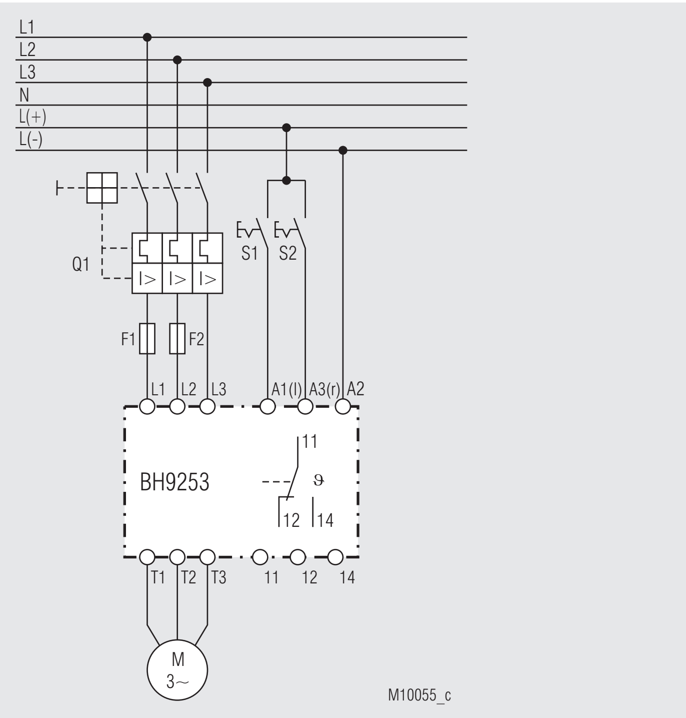
Application Examples



230/400 V AC-Mains
AC 230 V control voltage



230/400 V AC-Mains
AC 400 V control voltage



230/400 V AC-Mains
AC/DC 24 V control voltage

ATTENTION!

A1 and A3 has to be connected to the same phase. The common connection is terminal A2.

Connecting a parallel loud between A1 and A2 as well as A3 and A2 is not allowed