PETER electronic

BRAKING DEVICES
Catalogue
Electronic for drives

LGA InterCert Zertifiziertes QM System ISO 9001:2008

Quality is our Drive.

Table of contents

General information 1

With PETER electronic brakes it is possible to brake down asynchronous motors rapidly to a speed of zero rpm. The braking torque is generated through an adjustable DC voltage applied at the stator windings. PETER brakes are manufactured as a standard for braking currents up to 600A. The braking torque as well as braking time is adjustable. After detected standstill the braking current is switched off automatically with the VersiBrake standard range (exceptional VB LT).

Where drives have to be slowed down due to safety and time saving reasons the application of electronical braking devices is beneficial.
Some advantages:
- electronic braking goes easy on rested spared operation
- smooth braking via adjustable braking torque
- avoidance of resonance thresholds in screening and vibration applications
- increase of safeness
- cost reduction through shortening of coasting times
- multiple braking with just one device

Where a torque is needed while stand still, electronic brakes can be used as well.
Here a mechanical brake has to be incorporated additional in the application.
Electronic brakes are wear resistant and maintenance free.

Preferred field of application:
- wood working machines
- conveyer belts
- screening and vibration systems
- centrifuge
- machine tools
- meat processing machines
- textile machines
- drives with high masses/loads

Our service personnel will be pleased to be at your disposal via Email at: mail@peter-electronic.com. Rely on our competence and many years of experience. We will be happy to develop an individual solution for you, too. All braking systems sold by PETER electronic are "made in Germany".

Features:

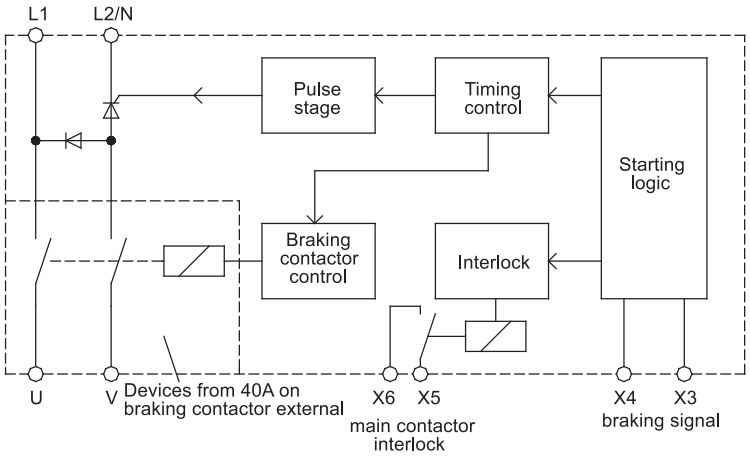
- DC Braking with one-way rectification
- suitable for all asynchronous motors
- easy mounting, also for retrofitting into existing plants
- weas-resistant end maintenance-free
- special voltages up tp 600V (20A-devices)
- special voltages up tp 690V (devices up from 40A)
- Integrated braking conductor (devices up to 20A)
- for snap-mounting onto 35mm top-hat-rail (devices up tp 20A)
- degree of protection IP 20 (BR 230/400 - 10 ... 20)
  degree of protection IP 00 (BR 230/400 - 40 ... 600)

Braking Devices
BR 230-10 ... 600
BR 400-10 ... 600

CE

Function:

- DC braking
- control via motor contactor
- 2 separately adjustable parameters
  braking current, braking time
- potential-free output for motor contactor
  interlocking during braking
  - loadable with 250V/8A
- potential-free output for braking contactor
  (devices up from 40A)
  - loadable with 250V/8A



Typical Application:

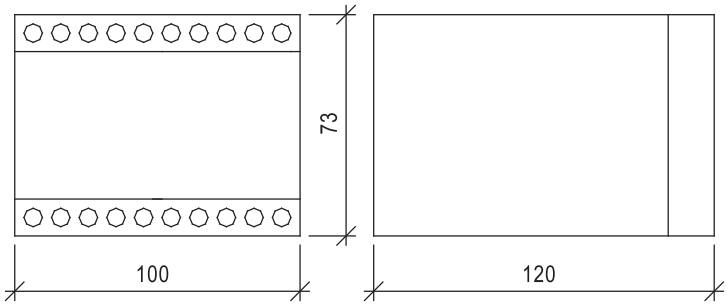
sawing machines
centrifuges
wood working machines
textile machines
conveying systems

Typical designation BR	230-10	230-20	230-40	230-60	230-100	230-200	230-400	230-600
	400-10	400-20	400-40	400-60	400-100	400-200	400-400	400-600
Rated device current	10A	20A	40A	60A	100A	200A	400A	600A
Mains voltage according to DIN EN 50160 (IEC 38)	BR 230 ... 220/240V ±10% 50/60Hz BR 400 ... 380/415V ±10% 50/60Hz				other voltages upon request			
Order number for BR 230- ...	21600. 22010	21600. 22020	21600. 22040	21600. 22060	21600. 22100	21600. 22200	21600. 22400	21600. 22600
for BR 400- ...	21600. 38010	21600. 38020	21600. 38040	21600. 38060	21600. 38100	21600. 38200	21600. 38400	21600. 38600

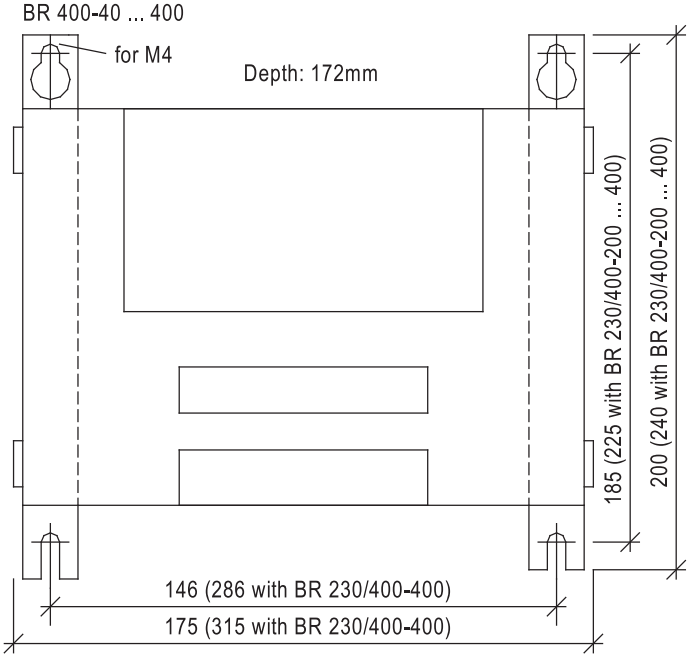
Please observe supplementary sheet with dimensioning rules!

Dimensions:

BR 230-10 ... 20
BR 400-10 ... 20



BR 230-40 ... 400
BR 400-40 ... 400



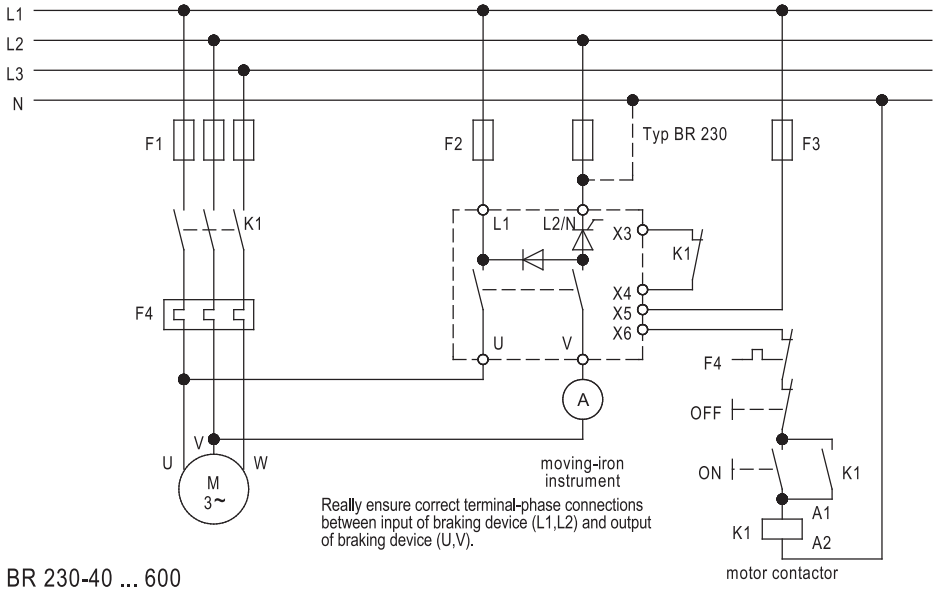
All dimensions in mm

Technical data BR	230-10 400-10	230-20 400-20	230-40 400-40	230-60 400-60	230-100 400-100	230-200 400-200	230-400 400-400	230-600 400-600
Mains voltage according to	BR 230 ...	220/240V ±10%	50/60Hz		other voltages			
DIN EN 50160 (IEC 38)	BR 400 ...	380/415V ±10%	50/60Hz		upon request			
Power draw of electronics	6 VA							
Recommended for rated motor currents up to	5A	10A	20A	30A	50A	100A	200A	300A
Rated device current	10A	20A	40A	60A	100A	200A	400A	600A
c.d.f. at max. braking current	20%	20%	15%	15%	15%	15%	15%	15%
I^2t-Value Power semiconductor in A^2s	40	680	8000	8000	8000	80000	320000	1125000
Braking voltage	0 ... 130VDC at 220/240V 0 ... 220VDC at 380/415V							
Braking time	2 ... 15s (other times upon request)							
Contact-	Relay contact for motor contactor = 6A/250VAC; 6A/30VDC							
rating	-		contact for braking contactor = 6A/250VAC; 6A/30VDC					
Delay time for reductions of residual e.m.f.	250ms	250ms	600ms	600ms	1500ms	1500ms	1500ms	1800ms
max. cross-sectional area	2,5mm²	2,5mm²	16mm²	16mm²	35mm²	35mm²	screw M8	screw M10
Ambient- / Storage temperature	0°C ... 45°C / -25°C ... 75°C							
Weight / kg	0,5	0,55	2,4	2,4	2,55	3,55	7,6	13,5

Connection Diagram:

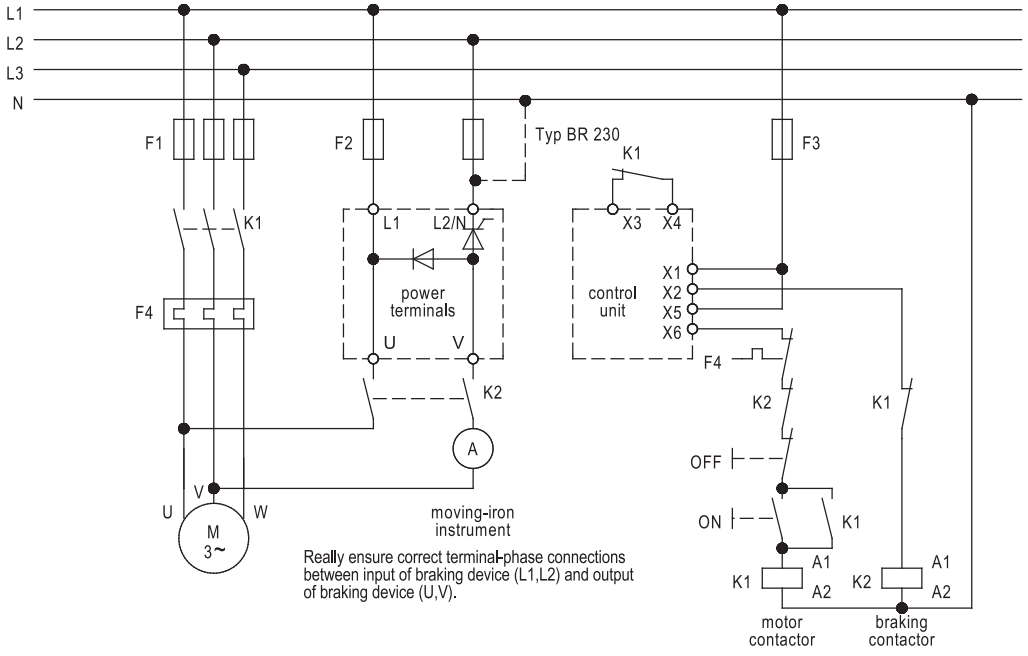
Attention:
If, in spite of a long braking time, the braking current is instantly switched off, the braking current is adjusted to a too high value.

BR 230-10 ... 20
BR 400-10 ... 20

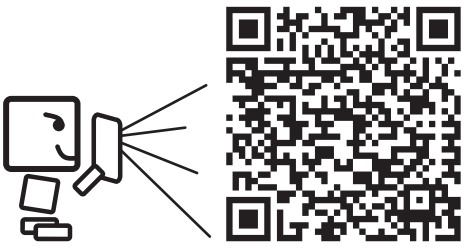


Really ensure correct terminal-phase connections between input of braking device (L1,L2) and output of braking device (U,V).

BR 230-40 ... 600
BR 400-40 ... 600

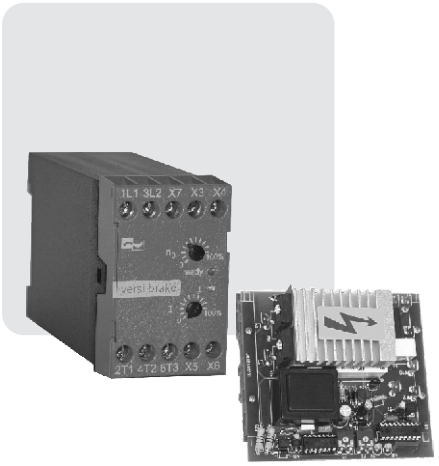


Really ensure correct terminal-phase connections between input of braking device (L1,L2) and output of braking device (U,V).



Features:

- DC braking with one-way rectification
- suitable for all asynchronous motors and for mono phase motors
- controlled by microcontroller
- easy mounting, also for retrofitting into existing plants
- wear-resistant and maintenance-free
- integrated braking contactor
- printed circuit-board version with fault signaling contact
- for snap-on mounting onto 35mm DIN rail
- degree of protection: case version IP 20, printed circuit-board version IP 00
- meets trade assoc. requirements for PL = b, acc. to DIN EN ISO 13849-1

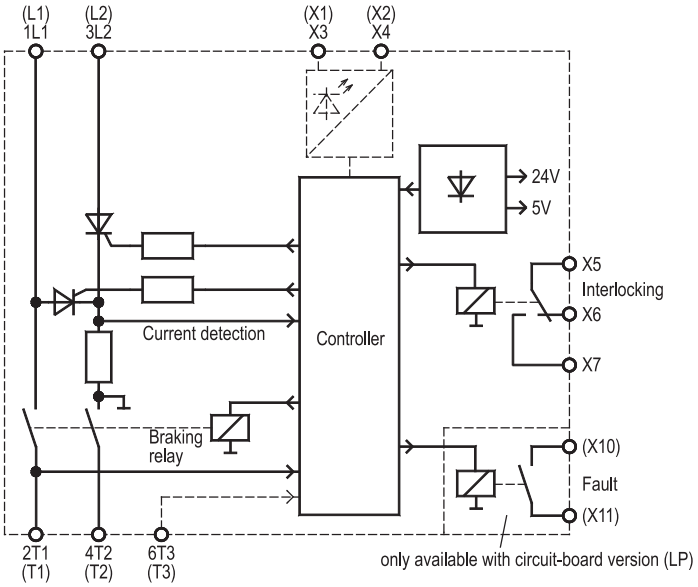


DGUV Test
IFA 1403003
Sicherheit geprüft
tested safety

Braking Devices
VB 230-6/25/30L (LP)
VB 400-6/25/30L (LP)
CE

Function:

- start braking via detection of motor voltage and via motor contactor (double safety)
- overload protection
- braking current cutoff after motor standstill
- braking current control
- automatic remanence time optimization
- braking current infinitely adjustable 10-100%
- potential-free output for motor contactor interlocking during braking; also usable to energize the star contactor during braking
- standstill threshold adjustable, individual adaptable to different motor types



Typical Application:

sawing machines
centrifuges
wood working machines
textile machines
conveying systems

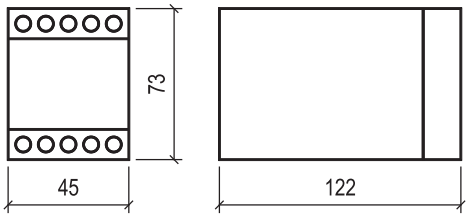
VersiBrake 230/400-6/25/30L (LP)

Type designation	VB 230-6L	VB 230-25L	VB 230-30L	VB 400-6L	VB 400-25LP	VB 400-30L
rated device current	6A	25A	30A	6A	25A	30A
mains voltage according to DIN EN 50160 (IEC 38)	220/240V ±10% 50/60Hz			380/415V ±10% 50/60Hz		
order number case version (L)	2B000.23006	2B000.23025	2B000.23030	2B000.40006	2B000.40025	2B000.40030
order number printed circuit-board version (LP)	2B100.23006	2B100.23025	2B100.23030	2B100.40006	2B100.40025	2B100.40030

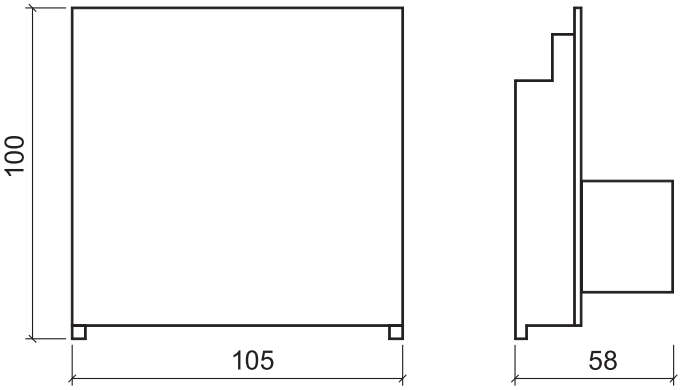
Please observe supplementary sheet with dimensioning rules.

Dimensions:

case version (L)



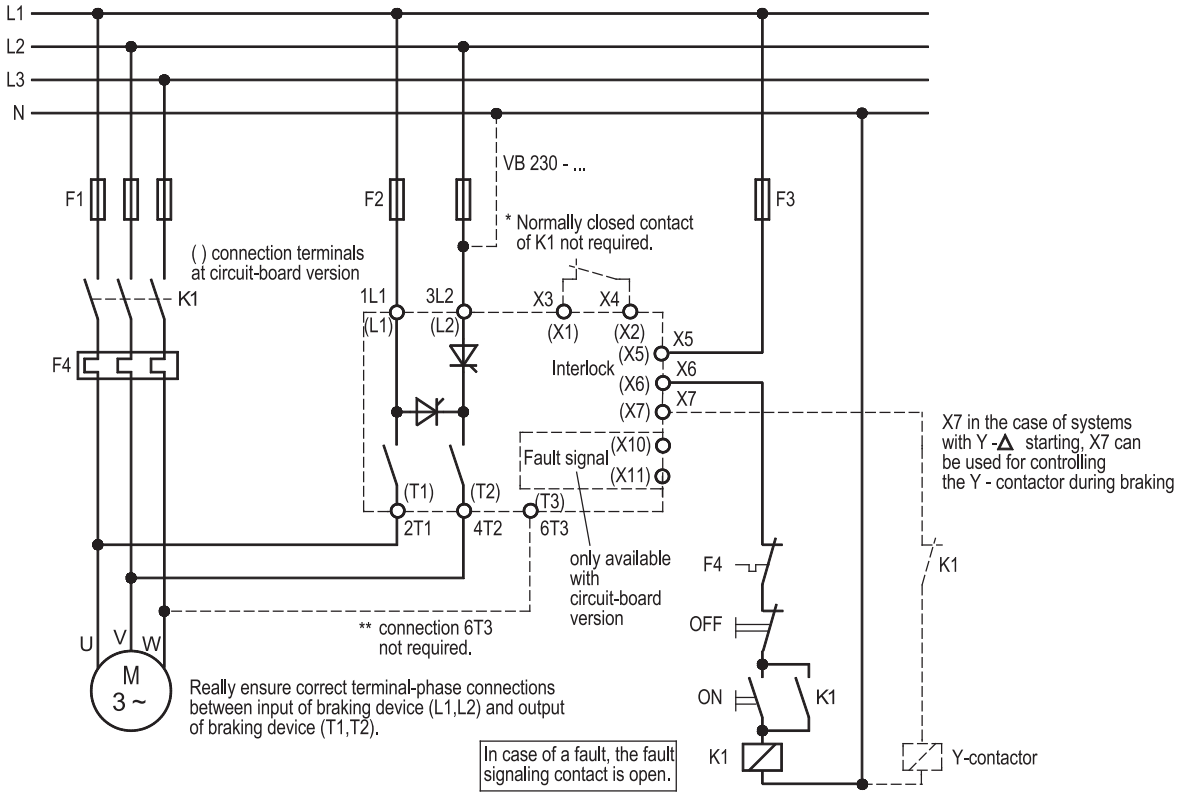
printed circuit-board verson (LP)



All dimensions in mm

Technical data	VB 230-6L	VB 230-25L	VB 230-30L	VB 400-6L	VB 400-25LP	VB 400-30L
mains voltage according to DIN EN 50160 (IEC 38)	220/240V ±10% 50/60Hz			380/415V ±10% 50/60Hz		
power draw of electronics	3 VA					
recommended for rated motor current up to	0,3 ... 3A	2 ... 12,5A	2 ... 15A	0,3 ... 3A	2 ... 12,5A	2 ... 15A
rated device current	6A	25A	30A	6A	25A	30A
max. braking frequency at braking time of 5s	1/8s	1/60s	1/90s	1/8s	1/60s	1/90s
I^2t-value of power semiconductors in A^2s	310	1250	1350	310	1250	1350
braking voltage	0 ... 110VDC			0 ... 220VDC		
max. braking time	12s					
contact rating (control relay)	3A/250VAC; 3A/30VDC					
delay time for reduction of residual e.m.f.	self-optimizing in the range between 0,2 ... 2s					
max. cross-sectional area for connection	2x 2,5mm² per terminal					
ambient /storage temperature	0°C ... 45°C / -25°C ... 75°C					
weight / kg	0,6					

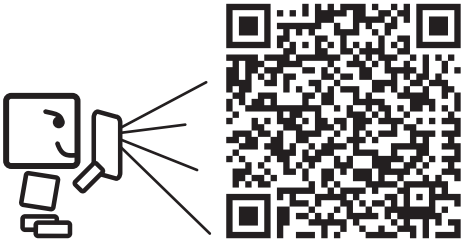
Connection Diagram:



Functional description:

* Connection of X3, X4 will only be needed if double security for the start of braking is required..

** Connection of 6T3 is only necessary with very short standstill times of motor (<3s). If 6T3 is not connected and a motor standstill is detected within 3s, the braking current is switched off after the security time. Therefore a failure is monitored.



Features:

- DC braking with one-way rectification
- suitable for all asynchronous motors and for mono phase motors
- controlled by microcontroller
- easy mounting, also for retrofitting into existing plants
- wear-resistant and maintenance-free
- integrated braking contactor
- for snap-on mounting onto 35mm DIN rail
- degree of protection IP 20
- successor for braking devices type BR und BR-L

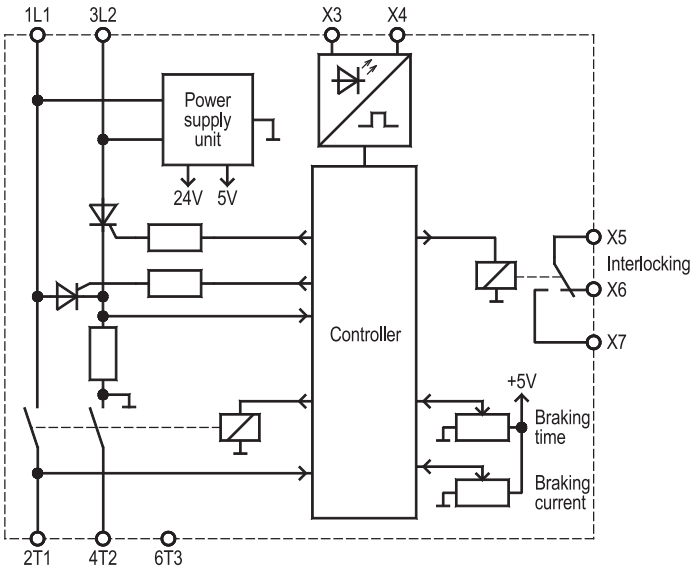
(photo similar)

Braking Devices
VB 230-6/25/30LT
VB 400-6/25/30LT

CE

Function:

- direct online start via motor contactor
- overload protection
- braking current control
- automatic remanence time optimization
- braking current infinitely adjustable 10-100%
- braking interrupt is possible
- restart 1,2s after braking interrupt
- braking time adjustable
- potential-free output for motor contactor
  Interlocking during braking;
  also usable to energize the star contactor
  during braking



Typical Applications:

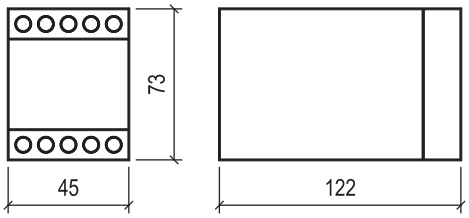
sawing machines
centrifuges
wood working machines
textile machines
conveying systems

VersiBrake 230/400-6/25/30LT

Type designation	VB 230-6LT	VB 230-25LT	VB 230-30LT	VB 400-6LT	VB 400-25LT	VB 400-30LT
Rated device current	6A	25A	30A	6A	25A	30A
mains voltage according to DIN EN 50160 (IEC 38)	220/240V ±10% 50/60Hz			380/415V ±10% 50/60Hz		
Order number printed circuit-board version	2B200.23006	2B200.23025	2B200.23030	2B200.40006	2B200.40025	2B200.40030

Please observe supplementary sheet with dimensioning rules!

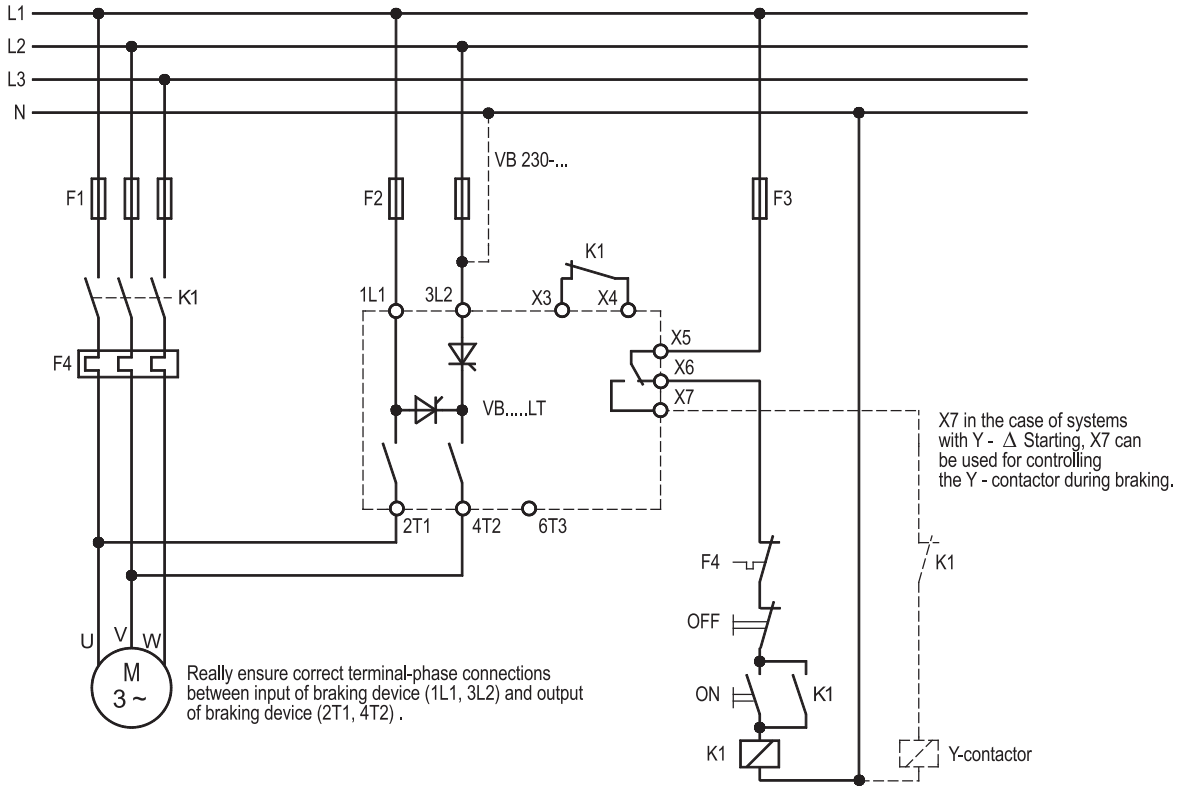
Dimensions:

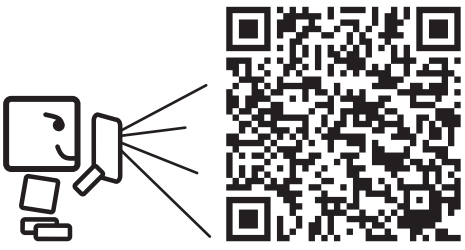


All dimensions in mm

Technical data	VB 230-6LT	VB 230-25LT	VB 230-30LT	VB 400-6LT	VB 400-25LT	VB 400-30LT
mains voltage according to DIN EN 50160 (IEC 38)	220/240V ±10% 50/60Hz			380/415V ±10% 50/60Hz		
Power draw of electronics	3 VA					
Recommended for rated motor current up to	0,3 ... 3A	2 ... 12,5A	2 ... 15A	0,3 ... 3A	2 ... 12,5A	2 ... 15A
Rated device current upto a braking time of 20s	6A	25A	30A	6A	25A	30A
Rated device current upto a braking time of 30s	6A	17A	20A	6A	17A	20A
max. Braking frequency at a braking time of 5s	1/8s	1/60s	1/90s	1/8s	1/60s	1/90s
I^2t-value of power semiconductors in A^2s	310	1250	1350	310	1250	1350
Braking voltage	0 ... 110VDC			0 ... 220VDC		
max. Braking time	0 ... 30s (special device 0 ... 60s available)					
Contact rating (control relay)	3A/250VAC; 3A/30VDC					
Delay time for reduction of residual e.m.f.	Self-optimizing in the range between 0,2 ... 1,8s					
max. Cross-sectional area for connection	2x 2,5mm² per terminal					
Ambient / Storage temperature	0°C ... 45°C / -25°C ...75°C					
Weight / kg	0,6					

Connection Diagram:





Features:

- DC Braking with one-way rectification
- controlled by microcontroller
- suitable for all asynchronous motors
- easy mounting, also for retrofitting into existing plants
- wear-resistant and maintenance-free
- special voltages up tp 575V (UL: bis 480V) with Option „B“
- for snap-mounting onto 35mm top-hat-rail
- degree of protection IP 20

Braking Devices

VB 230/400-25

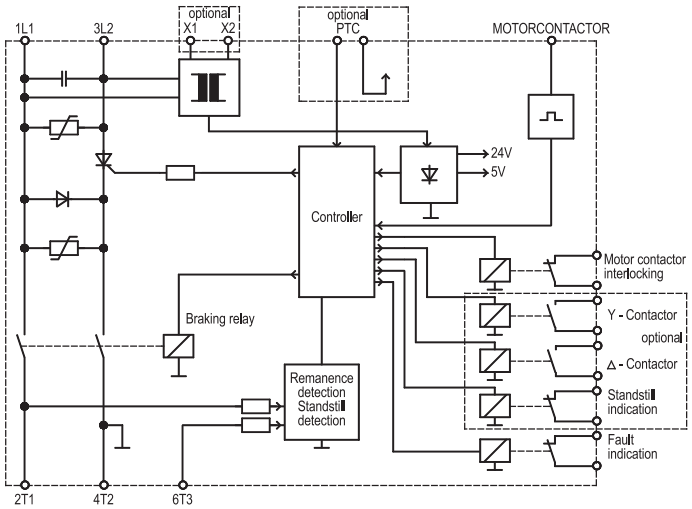
Function:

- control via motor contactor
- standstill detection
- braking current limited to rated device current
- remanence time optimization
- braking current infinitely adjustable
- potential-free output for motor contactor interlocking during braking
- potential-free output for fault signalling relay

Options:

(upon request)

- star-delta starting control (D)
- motor temperature monitoring (P)
- standstill sognalling relay (S)
- wide-voltage-range 200...575V (B)
  control voltage of 24VAC
  or 230VAC is necessary
  (please note on order)



Upon Request:

- printed circuit-board version

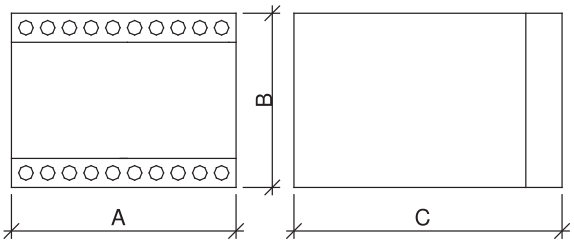
Typical Applications:

sawing machines
centrifuges
wood working machines
textile machines
conveying systems

Type designation VB ...		230-25 400-25		
Rated device current		25A		
Mains voltage according to DIN EN 50160 (IEC 38)		VB 230 ... 220/240V ±10% 50/60Hz VB 400 ... 380/415V ±10% 50/60Hz		Option „B“ 200...575V ±10% 50/60Hz
Order number	230V	21900.23025		
	400V	21900.40025		
	230V-UL	29800.23025		
	400V-UL	29800.40025		

Dimensions:

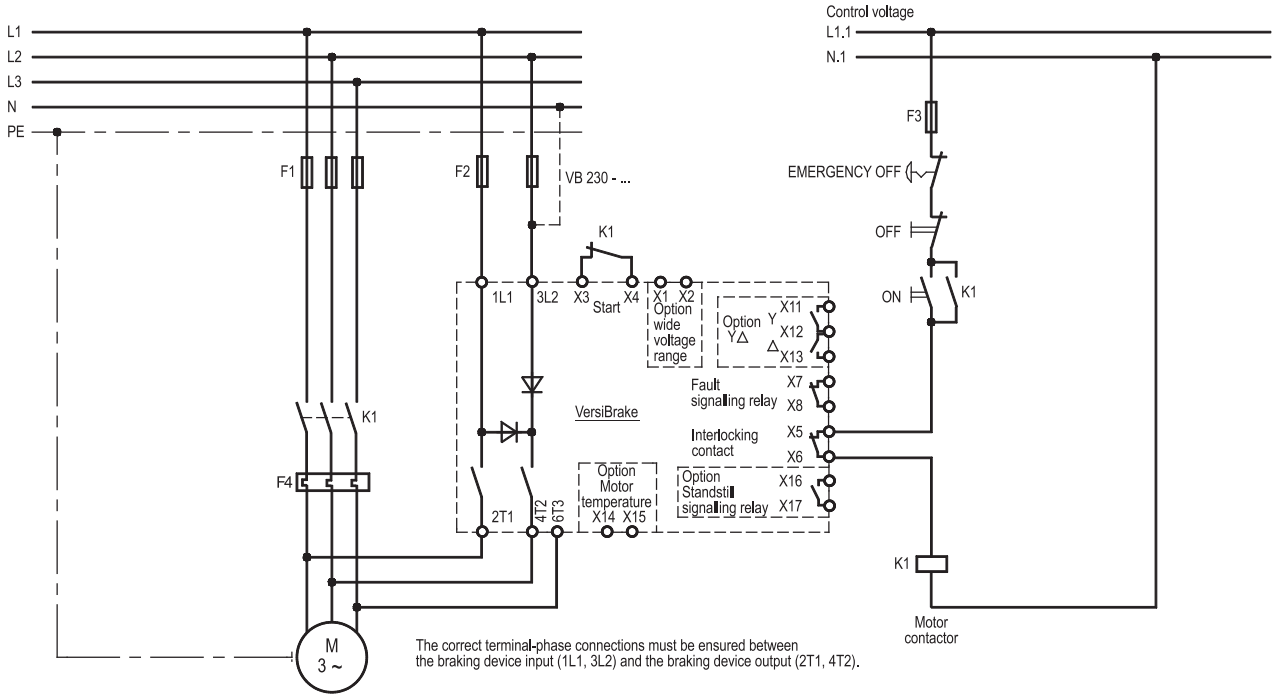
VB 230-25
VB 400-25

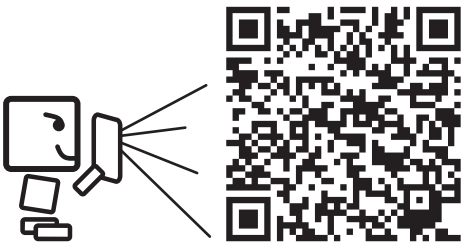


Mounting dimensions	A mm	B mm	C mm
VB ... -25	100	73	120

Technical data VB	230-25 400-25
Mains voltage according to	VB 230 ... 220/240V ±10% 50/60Hz Option „B“
DIN EN 50160 (IEC 38)	VB 400 ... 380/415V ±10% 50/60Hz 200..575V ±10% 50/60Hz
Power draw of electronics	6 VA
Recommended for rated motor current up to	12,5A
Rated device current	25A
c.d.f. at max. braking current	8%
I^2t-valuePower semiconductor in A^2s	1250
Braking voltage	0 ... 130VDC at 220/240V 0 ... 220VDC at 380/415V
max. Braking time	15s (other times upon request)
Contact rting (control relay)	6A/250VAC; 6A/30VDC
Delay time for reduction of residual e.m.f.	Self-optimizing in the range between (100 ... 2500ms)
max. Cross-sectional area	2x 2,5mm^2 per terminal
Ambient- / Storage temperature	0°C ... 45°C / -25°C ... 75°C
Weight / kg	0,8

Connection Diagram:





Subject to change without noticen.

Features:

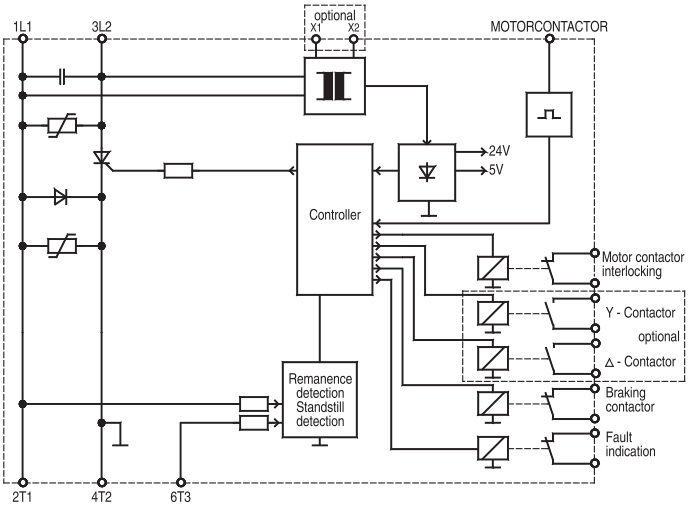
- DC Braking with one-way rectification
- controlled by microcontroller
- suitable for all asynchronous motors
- easy mounting, also for retrofitting into existing plants
- wear-resistant and maintenance-free
- special voltages up to 575V (UL: bis 480V) with Option „B“
- for snap-mounting onto 35mm top-hat-rail
- degree of protection IP 20

Braking Devices

VB 230/400-36

Function:

- control via motor contactor
- standstill detection
- braking current limited to rated device current
- remanence time optimization
- braking current infinitely adjustable
- potential-free output for motor contactor interlocking during braking
- potential-free output for fault signalling relay
- potential-free output for braking contactor
- temperature monitoring of power module



Options:

(upon request)

- star-delta starting control (D)
- wide-voltage-range 200...575V (B) control voltage of 24VAC or 230VAC (please note on order)

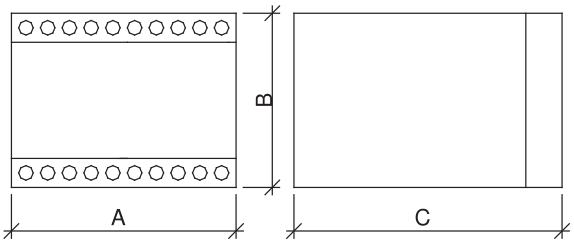
Typical Applications:

sawing machines
centrifuges
wood working machines
textile machines
conveying systems

Type designation VB ...		230-36 400-36			
Rated device current		36A			
Mains voltage according to		VB 230 ...	220/240V ±10%	50/60Hz	Option „B“
DIN EN 50160 (IEC 38)		VB 400 ...	380/415V ±10%	50/60Hz	200...575V ±10% 50/60Hz
Order number	230V	21900.23036			
	400V	21900.40036			
	230V-UL	29800.23036			
	400V-UL	29800.40036			

Dimensions:

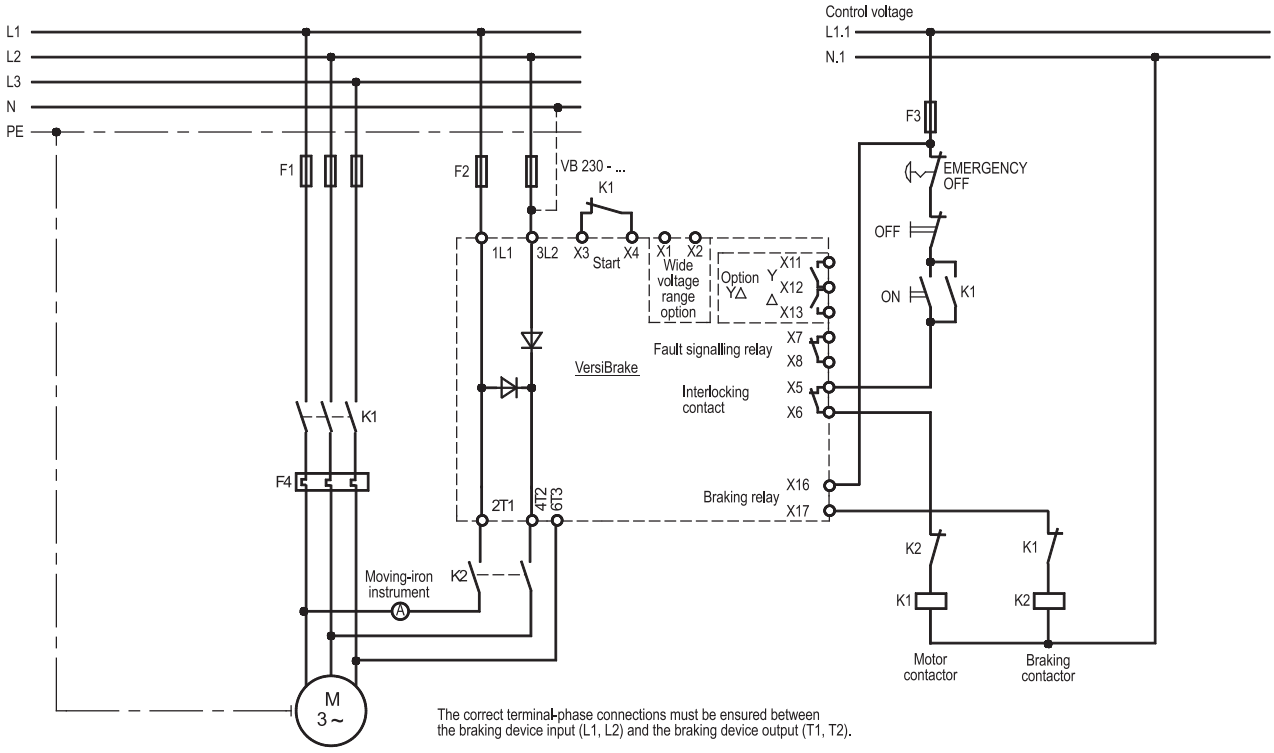
VB 230-36
VB 400-36

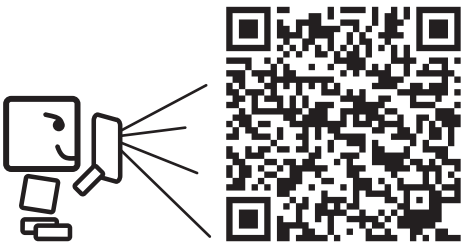


Mounting dimensions	A mm	B mm	C mm
VB ... -36	100	73	120

Technical data VB	230-36 400-36
Mains voltage according to	VB 230 ... 220/240V ±10% 50/60Hz Option „B“
DIN EN 50160 (IEC 38)	VB 400 ... 380/415V ±10% 50/60Hz 200..575V ±10% 50/60Hz
Power draw of electronics	6 VA
Recommended for rated motor current up to	17A
Rated device current	36A
c.d.f. at max. braking current	5%
I^2t-Value Power semiconductors in A^2s	1050
Braking voltage	0 ... 130VDC at 220/240V 0 ... 220VDC at 380/415V
max. Braking time	15s (other times upon request)
Contact rating of output relay	6A/250VAC; 6A/30VDC
Delay time for reduction of residual e.m.f.	Self-optimizing (100 ... 2500ms)
max. Cross-sectional area	2x 2,5mm^2 per terminal
Ambient / Storage temperature	0°C ... 45°C / -25°C ... 75°C
Weight / kg	1

Connection Diagram:





Merkmale:

- DC braking with on-way rectification
- controlled by microcontroller
- suitable fo all asynchronous motors
- easy mounting, also for retrofitting into existing plants
- wear-resistant and maintenance-free
- integrated braking contactor (devices up to 60A)
- degree of protection IP 20

Braking Devices

VB 230/400-40 ... 600

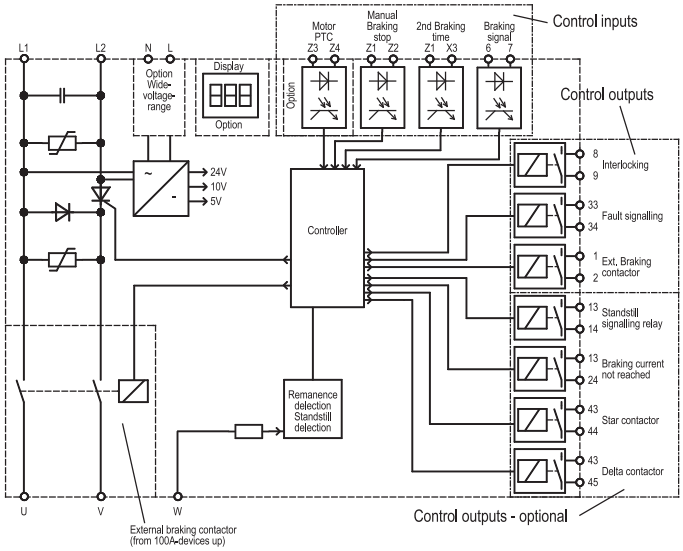
Function:

- control via motor contactor
- standstill- or time-dependent braking
- signalling relay for exceeded braking times
- braking current adjustments 0...100%, current control
- automatic menanence time optimization
- braking times 0,5 - 320s
- temperature monitoring of heat sink
- potential-free signalling and control outputs
- 2nd braking time 0,5 - 40s selectable
- manual braking stop selectable

Options:

(upon request)

- braking devices available with UL
- braking current display (AC*)
- wide voltage range 200 – 690V (BC*)
- plug-in control terminals (C)
- motor temperature monitoring (PC*)
- star-delta starting control (PC*)
- standstill signalling relay (PC*)
- braking current monitoring (PC*)
- adaptor for braking devices 40A-200A for mounting onto DIN rail (oder number 29000.29700)



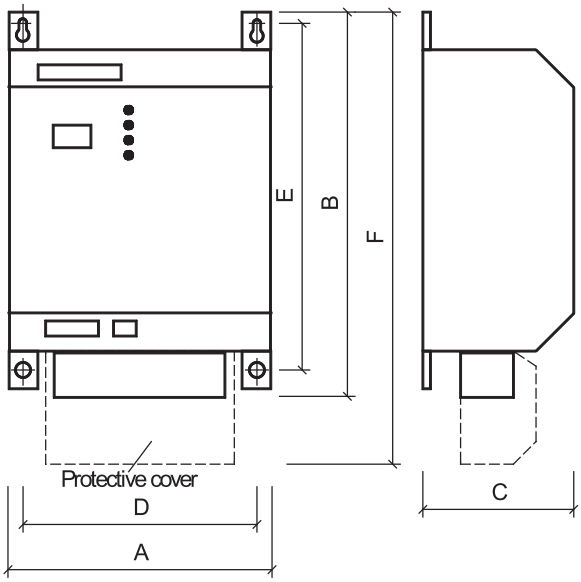
*devices with options are always equipped with pluggable control terminals

Typical Applications:

sawing machines
centrifuges
wood working machines
textile maschines
conveying systems

Typical designation VB ...		230-40 400-40	230-60 400-60	230-100 400-100	230-200 400-200	230-400 400-400	230-600 400-600
rated device current		40A	60A	100A	200A	400A	600A
mains voltage according to DIN EN 50160 (IEC 38)		220/240V ±10% 50/60Hz (standard) 380/415V ±10% 50/60Hz (standard) 200-690V ±10% 50/60Hz (wide voltage range)					
order number	230V	29700.23040	29700.23060	29700.23100	29700.23200	29700.23400	29700.23600
	400V	29700.40040	29700.40060	29700.40100	29700.40200	29700.40400	29700.40600
	UL-devices	upon request					

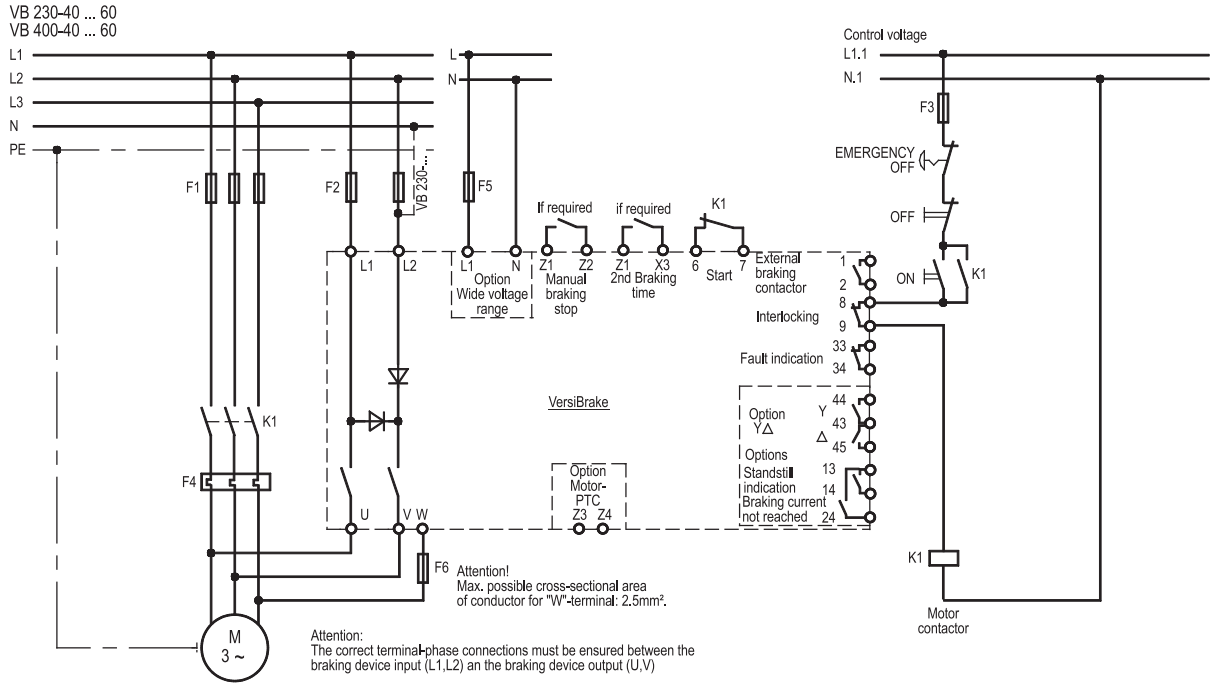
Dimensions:

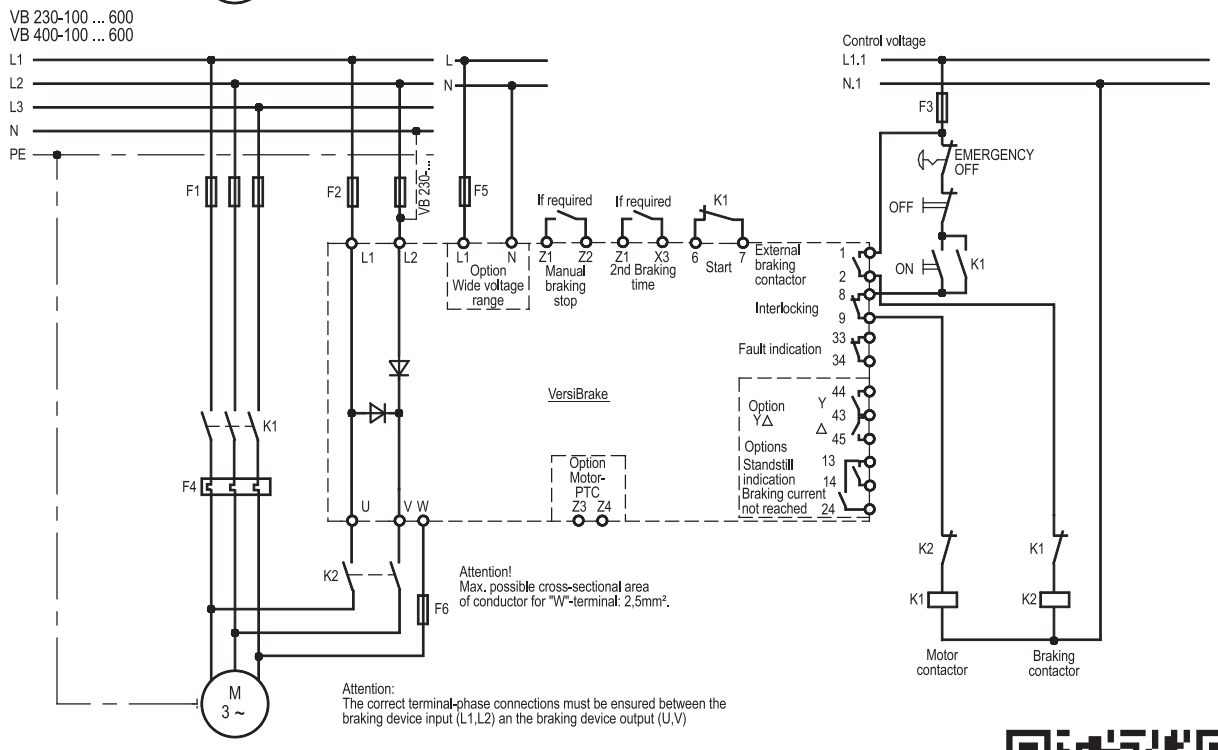


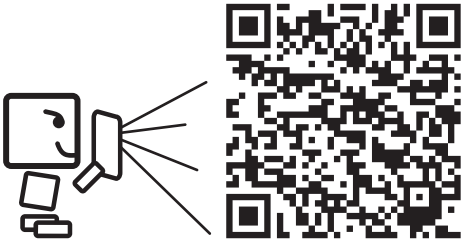
Mounting dimensions	A mm	B mm	C mm	D mm	E mm	F mm
VB ... -40	110	242	140	86	226	
VB ... - 60	110	242	140	86	226	
VB ... -100	110	242	140	86	226	
VB ... -200	110	255	155	80	226	
VB ... -400	210	275	165	180	226	340
VB ... -600	310	280	165	280	226	355

Technical data VB	230-40 400-40	230-60 400-60	230-100 400-100	230-200 400-200	230-400 400-400	230-600 400-600
mains voltage according to DIN EN 50160 (IEC 38)	220/240V ±10% 50/60Hz (standard) 380/415V ±10% 50/60Hz (standard) 200-690V ±10% 50/60Hz (wide voltage range)					
power draw of the electronics	6 VA					
recommended for rated motor currents up to	20A	30A	50A	100A	200A	300A
rated device current	40A	60A	10A	200A	400A	600A
c.d.f. at max. braking current	20%					
I^2t-value power semiconductor in A^2s	1050	4900	6050	80000	320000	1125000
braking voltage	0 ... 130VDC at 220/240V 0 ... 220VDC at 380/415V					
max. braking time	40s with standstill-dependent braking 320s with time-dependent braking					
contact rating of output relays	3A/250VAC; 3A/30VDC					
delay time for reduction of residual e.m.f.	self-optimizing (200 ... 310ms)		self-optimizing (1600 ... 3100ma)			
max. cross-sectional area	16mm²	16mm²	16mm²	35mm²	screw M12	
ambient / storage temperature	0°C ... 45°C / -25°C ... 75°C					
weight / kg	2,1	2,1	2,1	3,1	7,2	10,2

Connection Diagram:

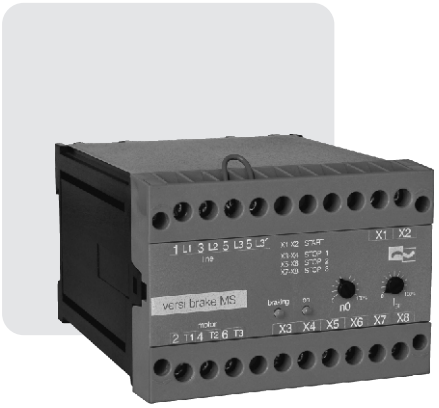






Features:

- simple motor control with only a few elements
- motor contactor and DC-brake in a single device
- suitable for all asynchronous motors
- controlled by microcontroller
- easy mounting, also for retrofitting into existing plants
- motor contactor with contact gap ≥ 3mm, utilization category AC-3
- operator's controls physically separated from load (24V extral-low voltage)
- connection of several „STOP“ buttons possible
- for snap-mounting onto 35mm top-hat rail
- degree of protection IP 20
- meets trade assoc. requirements for category 2 acc. to GS-HO-01
- intermateable with BRMS

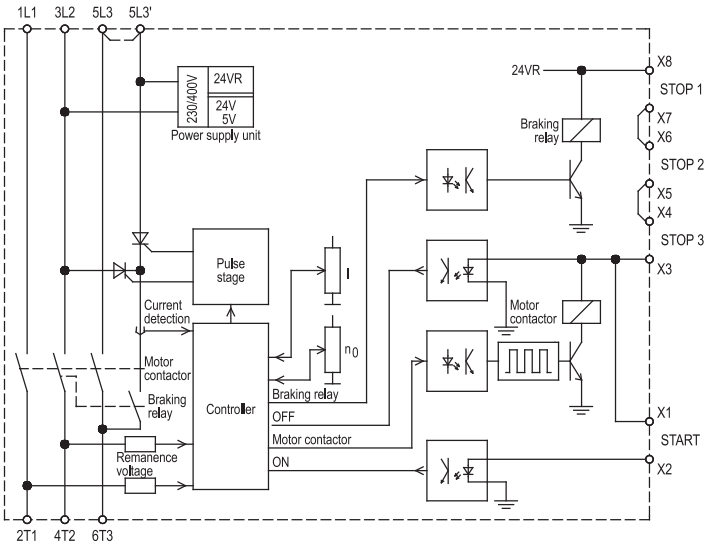


Combined Motor Start and Braking Devices
VBMS ...

CE

Function:

- direct online start via motor contactor
- DC braking
- control via buttons or via switch
- braking current infinitely adjustable
- standstill threshold adjustable
- braking current cutoff after motor standstill
- monitoring of braking frequency (overload protection)
- monitoring of exceeded braking time of 10s
- start interlock in case of safety relevant errors

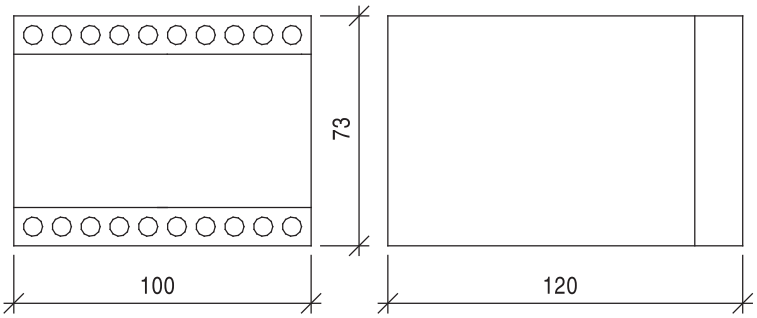


Typical Applications:

sawing machines
centrifuges
vibrators

Type designation	VBMS 400-2,2/20	VBMS 230-1,5/20
AC-3 rated operational power	2,2kW	1,5kW
rated operatinal voltage 50/60Hz according to DIN EN 50160 (IEC 38)	3x 380/415V ± 10%	AC-3 3x 200/240V ± 10%
order number	2C000.40020	2C000.23020

Dimensions:

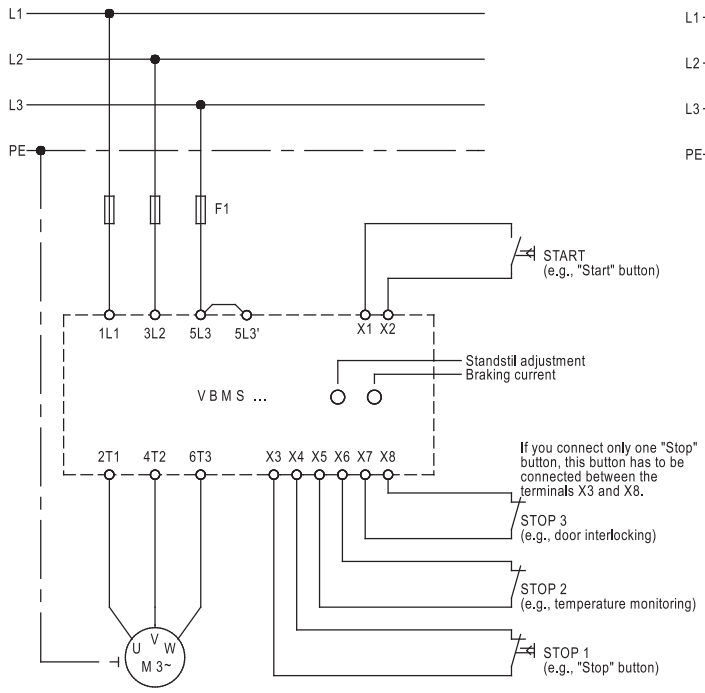


All dimensions in mm

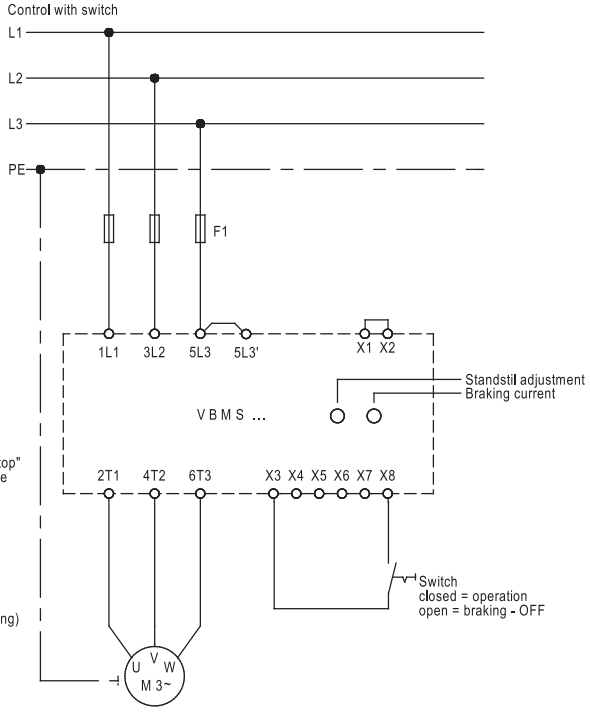
Technical data	VBMS 400-2,2/20	VBMS 230-1,5/20
rated operatinal voltage 50/60Hz according to DIN EN 50160 (IEC 38)	3x 380/415V ±10%	3x 200/240V ±10%
AC-3 rated operational power	2,2kW	1,5kW
conventional enclosed thermal current $I_{th} = I_e$ (valid for motor contactor)	16A	
braking current	2 ... 20A	
max. braking time	10s	
max. braking frequency at braking current 10A	at 5s braking time: 1 in 25s, at 10s braking time: 1 in 50s	
braking current 20A	at 5s braking time: 1 in 60s, at 10s braking time: 1 in 120s	
delay time during switch-off and braking	500ms	
braking voltage	0 ... 220V DC	0 ... 100V DC
max. cross-sectional area	2,5mm² per terminal	
ambient / storage temperature	0°C ... 45°C / -25°C ... 75°C	
weight / kg	0,6	

Connection Diagrams:

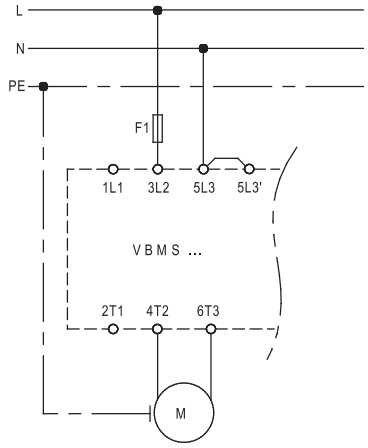
Control with push-button



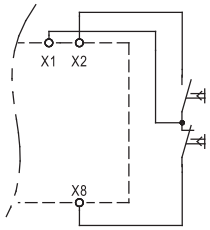
Control with switch



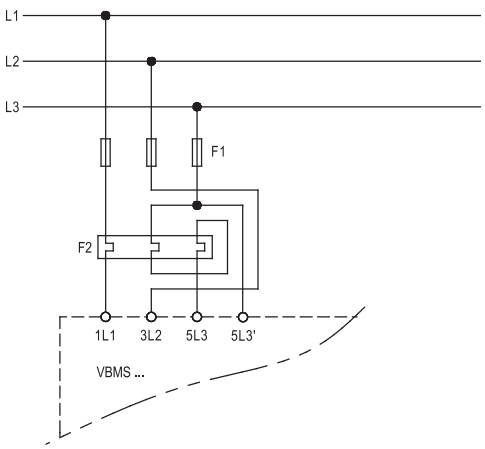
Connection for single-phase motor

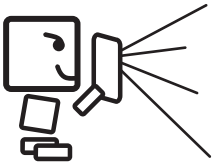


Connection "START/STOP" button with 3 conductors



Connection with motor protection relay





Subject to change without noticen.

Features:

- two-phase controlled soft start
- integrated by-pass relay
- reduction of starting current peaks
- DC braking via controlled thyristor bridge
- integrated braking contactor
- integrated standstill detection
- deceleration time monitoring
- controlled by microcontroller
- suitable for all asynchronous motors
- for snap-on mounting onto 35mm DIN rail
- degree of protection IP 20
- meets trade assoc. requirements for PL = b, acc. to DIN EN ISO 13849-1

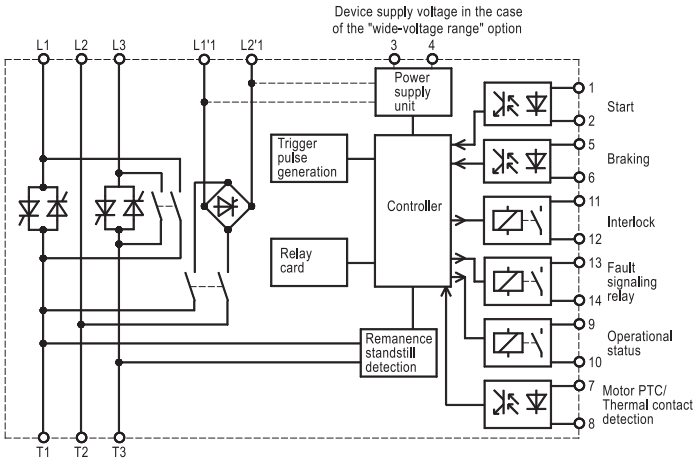
IFA 1103001
Sicherheit geprüft
tested safety

Combined Motor Start and Braking Devices

VC II 400-5,5 ... 15

Function:

- potential-free control input for soft start
- potential-free control input for braking
- braking current adjustment, current control
- standstill detection adaptable to motor via potentiometer
- 3 separately adjustable parameters starting torque, starting time, braking current
- motor contactor interlocking during braking
- temperature monitoring of heat sink



Options:

(upon request)

- special voltages 230V and 480V
- wide-voltage-range capable (200-480V) by additional control voltage 1AC 24V or 1AC 230V

Upon request:

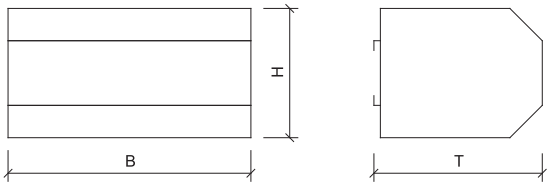
- customized enclosures

Typical Applications:

vibrators
wood working machines
centrifuges
drives with large centrifugal masses
belt drives

Type designation		VC II 400-5,5	VC II 400-7,5	VC II 400-11	VC II 400-15
motor rating at 400V mains voltage		5,5kW	7,5kW	11kW	15kW
motor rating at 230V mains voltage		3kW	4kW	5,5kW	7,5kW
mains / motor voltage according to DIN EN 50160 (IEC 38)		400V ±10% 50/60Hz			
order number	for VC II 400-...	26120.40005	26120.40007	226120.40011	26120.40015
	for VC II 400-... UL	26130.40005	26130.40007	26130.40011	26120.40015
special voltage (optional)		230V / 480V / wide-voltage-range 200 to 480V with external auxiliary voltage 1AC 24V or 1AC 230V			

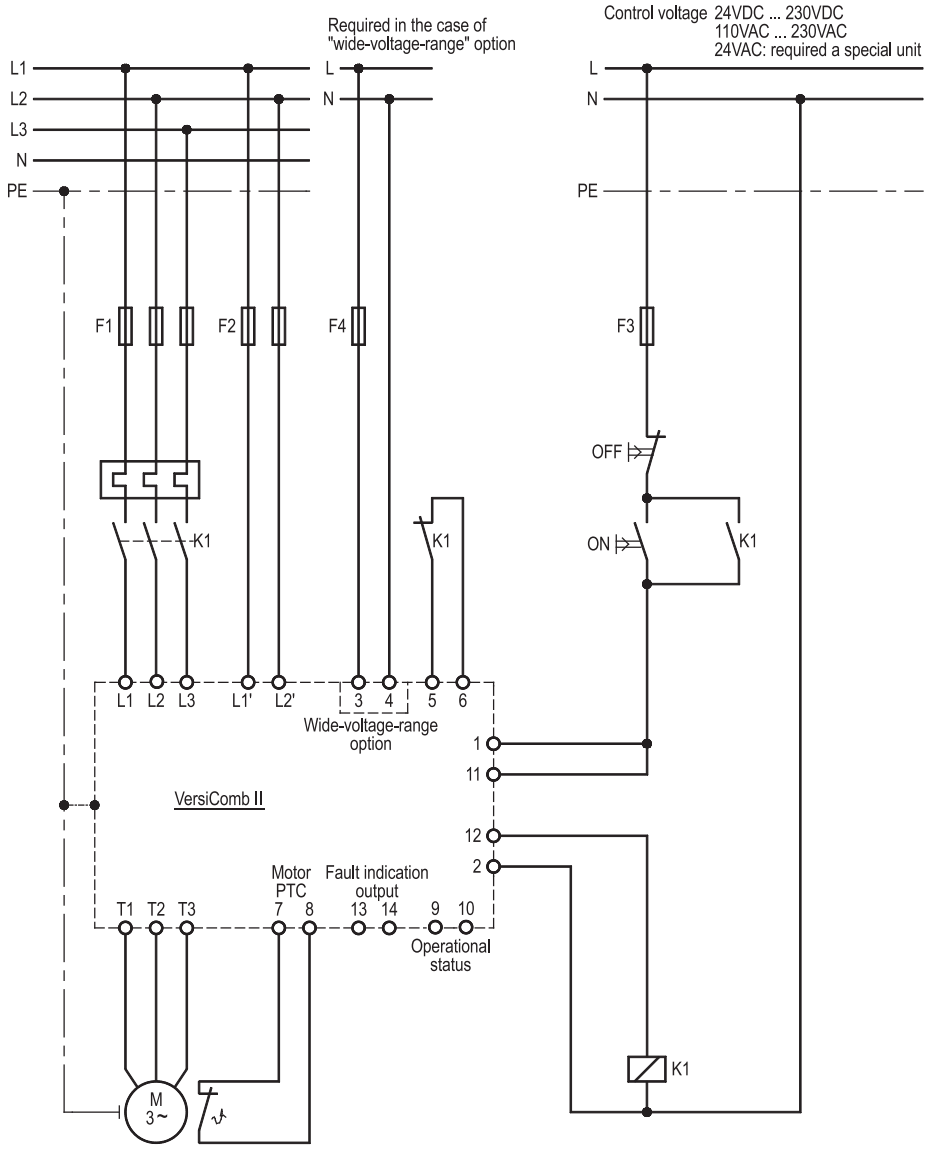
Dimensions:



Mounting dimensions	B mm	H mm	T mm
VersiComb II	166	106	117

Technical data	VC II 400-5,5	VC II 400-7,5	VC II 400-11	VC II 400-15
mains / motor voltage according to DIN EN 50160 (IEC 38)	400V ±10% 50/60Hz			
rated device current starting section	12A	15A	25A	32A
rated device current braking section	25A	35A	45A	55A
motor rating at 230V mains voltage	3kW	4kW	5,5kW	7,5kW
motor rating at 400V mains voltage	5,5kW	7,5kW	11kW	15kW
min. motor current	40% of the device rated current			
starting torque	0 ... 80%			
starting time	0,5 ... 16s			
braking voltage	0 ... 400VDC at 400V			
max. braking time	10s			
delay time for reduction of residual e.m.f.	self-optimizing (100 ... 1500ms)			
max. switching frequency with starting and braking time up to 10s each	30/h	30/h	30/h	20/h
contact loading of output relays	3A / 250VAC			
max. cross-sectional area for connection				
control terminals	2,5mm²			
power terminals	4mm² flexible; 6mm² rigid			
I^2t-values of power semiconductors/starting section in A^2s	1350	6050	7200	7200
I^2t-values of power semiconductors/braking section in A^2s	1350	1350	6050	7200
ambient- / storage temperature	0°C ... 45°C / -25°C ... 75°C			
weight / kg	1,5			

Connection Diagram:



Subject to change without noticen.

How to dimension a Braking Device?

The motor ratings or nominal motor currents specified or recommended on the datasheets for the use of a braking device refer to normal applications with drives having a moment of inertia that approximately equals the moment of inertia of the motor. In all other cases, the required braking torque or braking current need to be determined more precisely (see below).

Without taking into account any possible braking torques of the load, the required braking current (direct current) can be estimated according to the following formula:

$$I_B = f_B \times \sqrt{\frac{t_A}{t_B}} \times I_N$$

I_B Braking current in A
f_B Braking factor acc. to the table specified below
t_B Braking time required in s
I_N Nominal/rated motor current in A
t_A Time until nominal speed is reached (in the case of motors with star-delta start – approx. switch-over time)

Values usual for t_A:

Conveyor belt - 20s	Pump - 8s	Power crusher - 30s
Compressor - 10s	Fan - 20s	Circular saw - 10s

Connection of motor winding at nominal operation	during braking	
		
		

The following example is to explain the calculation:

Example 1

Assumption:		
	Motor shaft power:	2.2kW (230V/400V)
	Nominal motor current (2-pole motor):	8.5A/4.9A
	Ramp-up time (circular saw):	6s (direct start)
	Braking frequency:	1/h

The application of the circular saw requires that, after switching the saw off, the saw disk must come to a standstill within 5s. From this, there results a maximum braking time of 5s which we use in the calculation formula, too:

$$16{,}1A = 3 \times \sqrt{\frac{6s}{5s}} \times 4{,}9A$$

In the case of this application with direct start, the motor windings are in nominal operation star-connected. Braking too is effected in star-connection, which results in a braking current of approx. 16A (fB – 3), i.e, for this circular saw, a braking device with a nominal/rated current of at least 20A, such as a VB 400-25L or VB 400-25 (with a max. braking current of 25A each), has to be used.

A very importand aspect in the dimensional calculation of brakes is to take into account the cyclic duration factor (c.d.f.) indicated on the data sheets. Under no circumstances the c.d.f. be exceeded (the worst case is to be taken into account!!).

How to calculate the cyclic duration factor (c.d.f.):

$$c.d.f = \frac{t_B}{t_Z} \times 100$$

t_B Braking time
t_Z Cycle time (running - braking)

If the required cyclic duration factor (c.d.f.) exceeds the permissible values indicated on the data sheet, the permissible maximum braking current is to be accordingly reduced.

The data required in this connection can be found in the device-specific commissioning instructions. If it is not possible to reduce the braking current, a braking device with a higher braking current has to be used.

Example:
If the required c.d.f. is twice as high as the value indicated on the data sheet, a braking device of twice the nominal/rated device current has to be used.

How to rate the braking contactors?
The braking contactor is switched on or off via a control contact of the braking device (no-load switching). When selecting the braking contactor, it must be ensured that the contacts are able to carry the maximally occurring braking current (nominal/rated device current). Therefore, the value “conventional thermal current”(Ith) is decisive when selecting the braking contactor. If this value is not indicated, the rated operational current for AC1-operation may be used instead.

Advice:
By connecting contacts in parallel it is often possible to use a lower-priced contactor of a smaller design.

How to rate the pre-fuses?
Basically, two types of fuse are available for the user:
1. Fusing according to allocation type „1“ DIN EN 60947-4-2.
   After a short circuit, the braking device is allowed to be inoperative.
2. Fusing according to allocation type „2“ DIN EN 60947-4-2.
   After a short circuit, the braking device must be suitable for further use. However, there is the danger that the contacts of the braking relay (braking contactor) weld. Therefore, if possible, these contacts are to be checked prior to reconnecting the device to the supply. If this check cannot be carried out by the user, the device has to be returned to the producer in order to have it checked.

The following dimensioning information refers to the below operating conditions:
- Use of standard asynchronous motors
- Braking time not exceeding 20s, for braking devices up to 36A
- Braking time not exceeding 40s, for braking devices from 40A up
- Braking current not exceeding 2.5x INOM of the motor
- Cyclic duration factor (c.d.f.) not exceeding the value indicated on the data sheet

Fusing according to allocation type „1“:
As pre-fuses, we recommend to use line protection fuses (utilization category gL) or automatic circuit-breakers with tripping characteristic B, C, D or K. Taking into account the maximum braking currents that occur (normally the nominal/rated device current), we recommend fuses according the information in the respective instruction manual.

Note! Wiring cross-sectional area according to DIN VDE 0100-430, DIN EN 57100-430.

Fusing according to allocation type „2“:
The power semiconductors are to be protected by fuses of the utilization category gR (semiconductors fuses, high-speed fuses). However, since these fuses do not ensure line protection, it is necessary to use additionally line protection fuses (utilize. Category gL). As for the dimensioning of the line protection fuse (gL), please refer to the instruction manual. To protect the semiconductors it is necessary to select gR-fuses featuring cutoff I^2t-values of the ranges indicated in technical data sheet or instruction manual.
In this connection, the current value of the selected fuse should not be smaller than the braking current to be expected (nominal/rated device current).

Notes
- On the basis of the recommended I^2t-value, braking current, and possibly the c.d.f., the fuse supplier is able to select a suitable type. Due to the great variety of producers, sizes and types, PETER electronic does not recommend any particular fuses.
- If the value of the fuse or cutoff-I^2t is selected too small, it may happen that the semiconductor fuse reacts during braking

How to rate the fuse F6?
At least 2A. You have to use this fuse to allow a reduction of the wiring cross-sectional area (connection 6T3 to W).

Is it possible to brake down more motors in parallel with only one Braking Device?
Yes! But please note the Braking Device must be dimensioned adequate to cover the total power of the connected motors (max. 3).

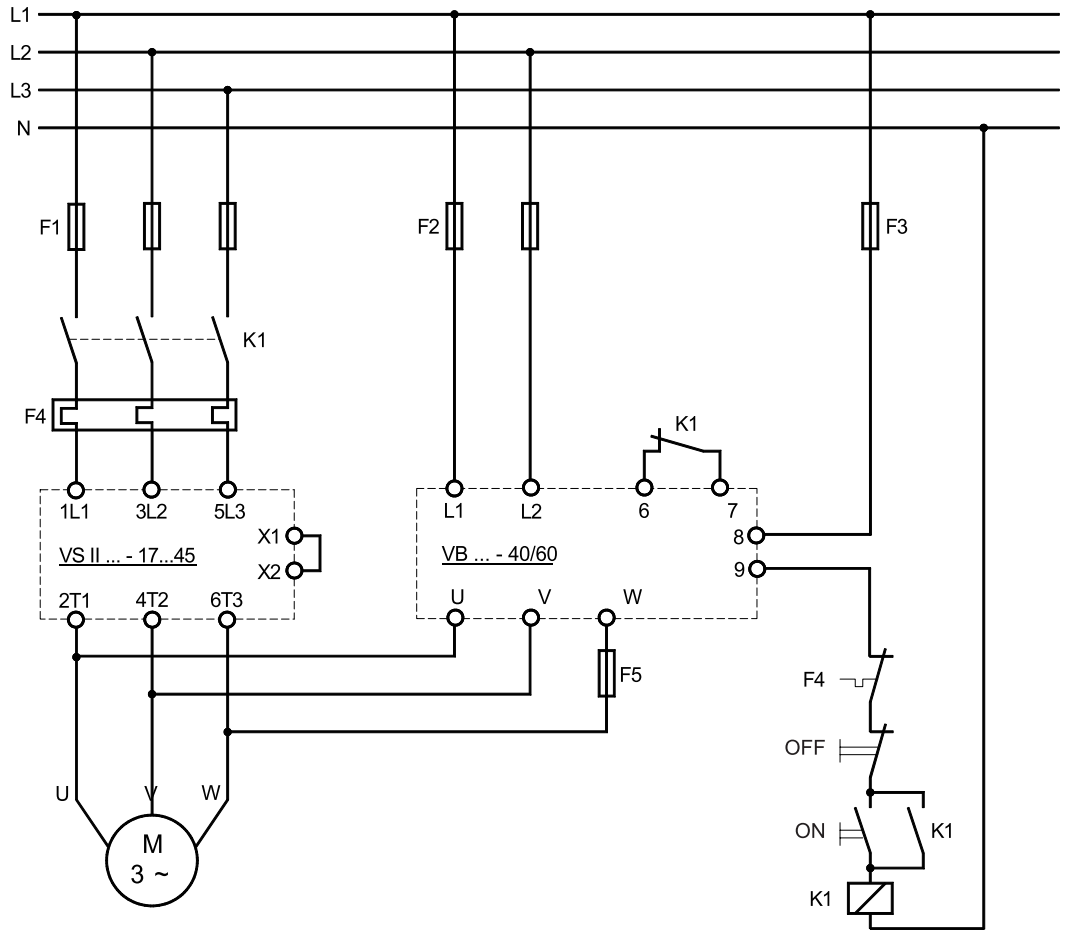
Advice:
please have a look at www.peter-electronic.com to find relevant connection diagrams for these kind of applications.

Is it possible to brake down more motors in series with only one Braking Device?
Yes, this is basically possible. The amount of motors connected in series should be limited to two (motor winding resistance). Hence we recommend to use the connection in parallel (see above).

Is it possible to use PETER electronic DC Brakes also in combination with a sensorless Saftey Standstill Monitor?
If you are using the PETER electronic VersiSafe in combination with our Brakes there will be no restrain in functionality.

Is it possible to install a DC-brake on a motor where a Softstarter is already build in?
Yes, without any problems! All our Braking Devices and Softstarter are perfectly applicable for a combination. This kind of combination will give you an even smoother performance of your application!

Example of a Softstart and Braking Device combination:



Please find more connection diagrams at www.peter-electronic.com

Phone: **+49(0)9189/4147-0** Fax: **+49(0)9189/4147-47** eMail: **mail@peter-electronic.com**

www.peter-electronic.com

Braking Devices

PETER electronic

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