

### Motor protection circuit breakers SM1... up to 40A. Magnetic and thermal protection



SM1P...



SM1R...



Order code	Thermal trip adjustment range		Short circuit breaking capacity at 400V		Qty per pack	Wt
	[A]	[A]	Icu [kA]	Ics [kA]		
Button control.						
SM1P 0016	0.1...0.16		100	100	1	0.280
SM1P 0025	0.16...0.25		100	100	1	0.280
SM1P 0040	0.25...0.4		100	100	1	0.280
SM1P 0063	0.4...0.63		100	100	1	0.280
SM1P 0100	0.63...1		100	100	5	0.280
SM1P 0160	1...1.6		100	100	5	0.280
SM1P 0250	1.6...2.5		100	100	5	0.350
SM1P 0400	2.5...4		100	100	5	0.350
SM1P 0650	4...6.5		100	100	5	0.350
SM1P 1000	6.3...10		100	100	5	0.350
SM1P 1400	9...14		25	12.5	5	0.350
SM1P 1800	13...18		25	12.5	5	0.350
SM1P 2300	17...23		15	5	1	0.350
SM1P 2500	20...25		15	5	1	0.350
SM1P 3200	24...32		10	5	1	0.350
SM1P 4000	30...40		10	5	1	0.350
Rotating type.						
SM1R 0016	0.1...0.16		100	100	1	0.320
SM1R 0025	0.16...0.25		100	100	1	0.320
SM1R 0040	0.25...0.4		100	100	1	0.320
SM1R 0063	0.4...0.63		100	100	1	0.320
SM1R 0100	0.63...1		100	100	5	0.320
SM1R 0160	1...1.6		100	100	5	0.320
SM1R 0250	1.6...2.5		100	100	5	0.320
SM1R 0400	2.5...4		100	100	5	0.390
SM1R 0650	4...6.5		100	100	5	0.390
SM1R 1000	6.3...10		100	100	5	0.390
SM1R 1400	9...14		100	100	5	0.390
SM1R 1800	13...18		100	100	5	0.390
SM1R 2300	17...23		50	25	1	0.390
SM1R 2500	20...25		50	25	1	0.390
SM1R 3200	24...32		50	25	1	0.390
SM1R 4000	30...40		20	25	1	0.390

#### General characteristics

SM1P... and SM1R... are modern circuit breakers with thermal and magnetic trip releases and high breaking capacity.

Motor control and protection of up to 22kW (400V) are possible by choosing the suitable adjustment range, from 0.1 to 40A.

The dimensions of SM1P... breakers are compliant with the DIN43880 standard, allowing them to be mounted in all modular enclosures on the market.

A magnetic trip indicator integrated on the SM1R... breakers avoids dangerous closing operations during short-circuit conditions, previously disconnected by the breaker. SM1R... breakers are Type E-certified according to UL508. SM1P... and SM1R... motor protection circuit breakers are suitable for isolation in accordance with IEC/EN 60947 standards and can be padlocked in OFF position without using accessories.

Their high breaking capacity permits the elimination of protection fuses on the majority of installations.

#### Operational characteristics

- IEC rated insulation voltage  $U_i$ : 690V
- IEC rated impulse withstand voltage: 6kV
- Rated frequency: 50/60Hz
- Rated maximum current: 40A
- Adjustment ranges: 16
- IEC breaking capacity: see [www.mechtric.com.au](http://www.mechtric.com.au)
- Heat dissipation per phase: 0.7...3.3W
- Magnetic tripping: 13In max.
- Tripping class: 10A
- Phase failure sensitive
- Mechanical endurance: 100,000 cycles
- Electrical endurance: 100,000 cycles
- Mounting on 35mm DIN rail (IEC/EN 60715)
- Mounting position: any
- IEC utilisation category: A
- Padlocking in OFF:  $\varnothing 4\text{mm}/0.16''$
- Protection rating: IP20.

#### Certifications and compliance

Certifications obtained: cULus, EAC, CCC. SM1R... breakers are Type E-certified (Self-Protected Combination Motor Controllers) according to UL508.

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1, UL508, CSA C22.2 n° 14.

Plastic materials compliant with standards: IEC/EN 60335 and EN 45545

### Motor protection circuit breakers SM1RM... up to 40A. Magnetic protection



SM1RM...



Order code	Rated and magnetic trip current		Short circuit breaking capacity at 400V		Qty per pack	Wt
	Rat. [A]	Trip. [A]	Icu [kA]	Ics [kA]		
Rotating type.						
SM1RM 0016	0.16	1.6	100	100	1	0.320
SM1RM 0025	0.25	3.2	100	100	1	0.320
SM1RM 0040	0.4	5.2	100	100	1	0.320
SM1RM 0063	0.63	8.2	100	100	1	0.320
SM1RM 0100	1	13	100	100	5	0.320
SM1RM 0160	1.6	21	100	100	5	0.320
SM1RM 0250	2.5	33	100	100	5	0.320
SM1RM 0400	4	52	100	100	5	0.390
SM1RM 0650	6.5	85	100	100	5	0.390
SM1RM 1000	10	130	100	100	5	0.390
SM1RM 1400	14	182	100	100	5	0.390
SM1RM 1800	18	234	100	100	5	0.390
SM1RM 2300	23	299	50	25	1	0.390
SM1RM 2500	25	325	50	25	1	0.390
SM1RM 3200	32	416	50	25	1	0.390
SM1RM 4000	40	420	20	25	1	0.390

#### General characteristics

SM1RM... are motor protection circuit breakers with magnetic tripping only and high breaking capacity.

They are typically used to protect starters where there is a thermal relay or other overload protection.

Starter control and protection of up to 22kW (400V) are possible by choosing the suitable adjustment range, from 0.1 to 40A.

#### Operational characteristics

- IEC rated insulation voltage  $U_i$ : 690V
- IEC rated impulse withstand voltage: 6kV
- Rated frequency: 50/60Hz
- Rated maximum current: 40A
- IEC breaking capacity: see [www.mechtric.com.au](http://www.mechtric.com.au)
- Heat dissipation per phase: 0.7...3.3W
- Magnetic tripping: 13In max.
- Mechanical endurance: 100,000 cycles
- Electrical endurance: 100,000 cycles
- Mounting on 35mm DIN rail (IEC/EN 60715)
- Mounting position: any
- IEC utilisation category: A
- Padlocking in OFF:  $\varnothing 4\text{mm}$
- Protection rating: IP20.

#### Certifications and compliance

Certifications obtained: cULus, EAC, CCC. Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1, UL508, CSA C22.2 n° 14.

Plastic materials compliant with standards: IEC/EN 60335 and EN 455 5

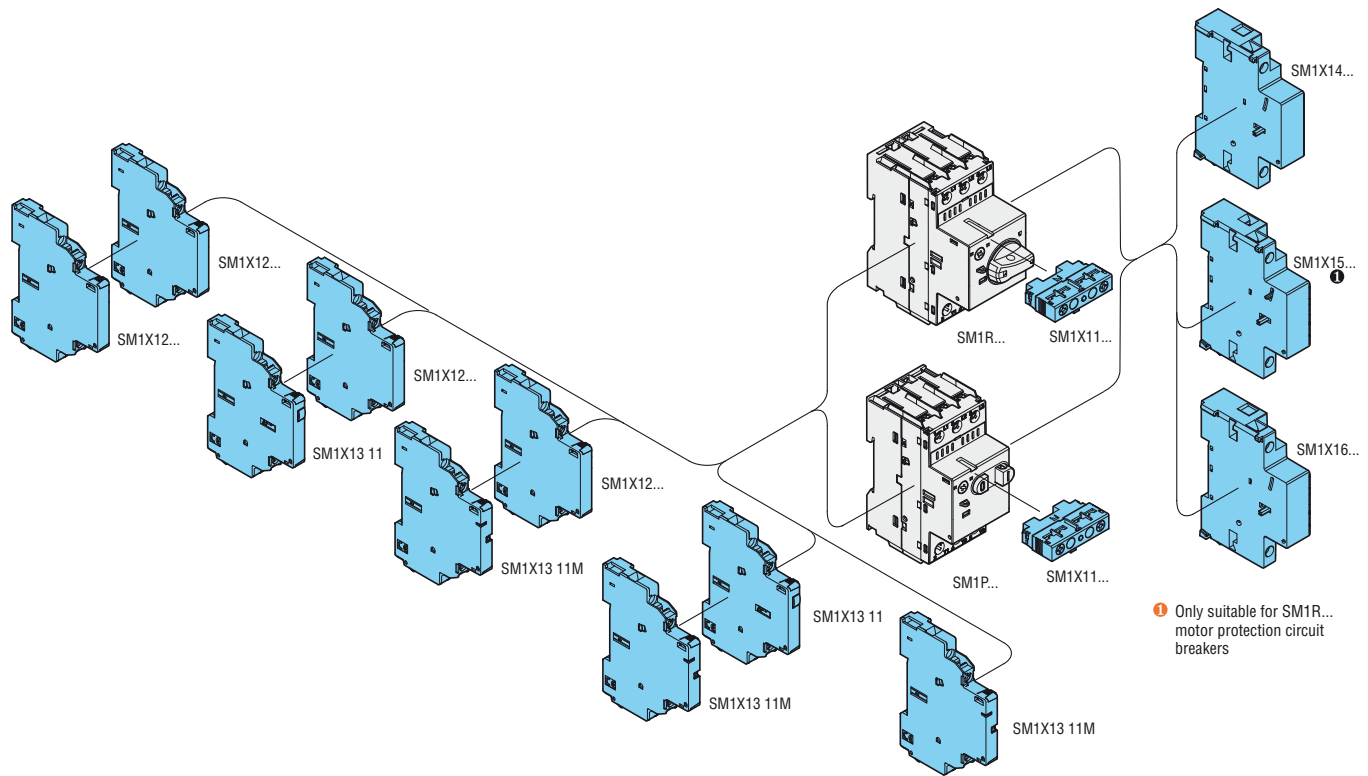
See page 2-9 for dimensions.

# MOTOR & CIRCUIT PROTECTION

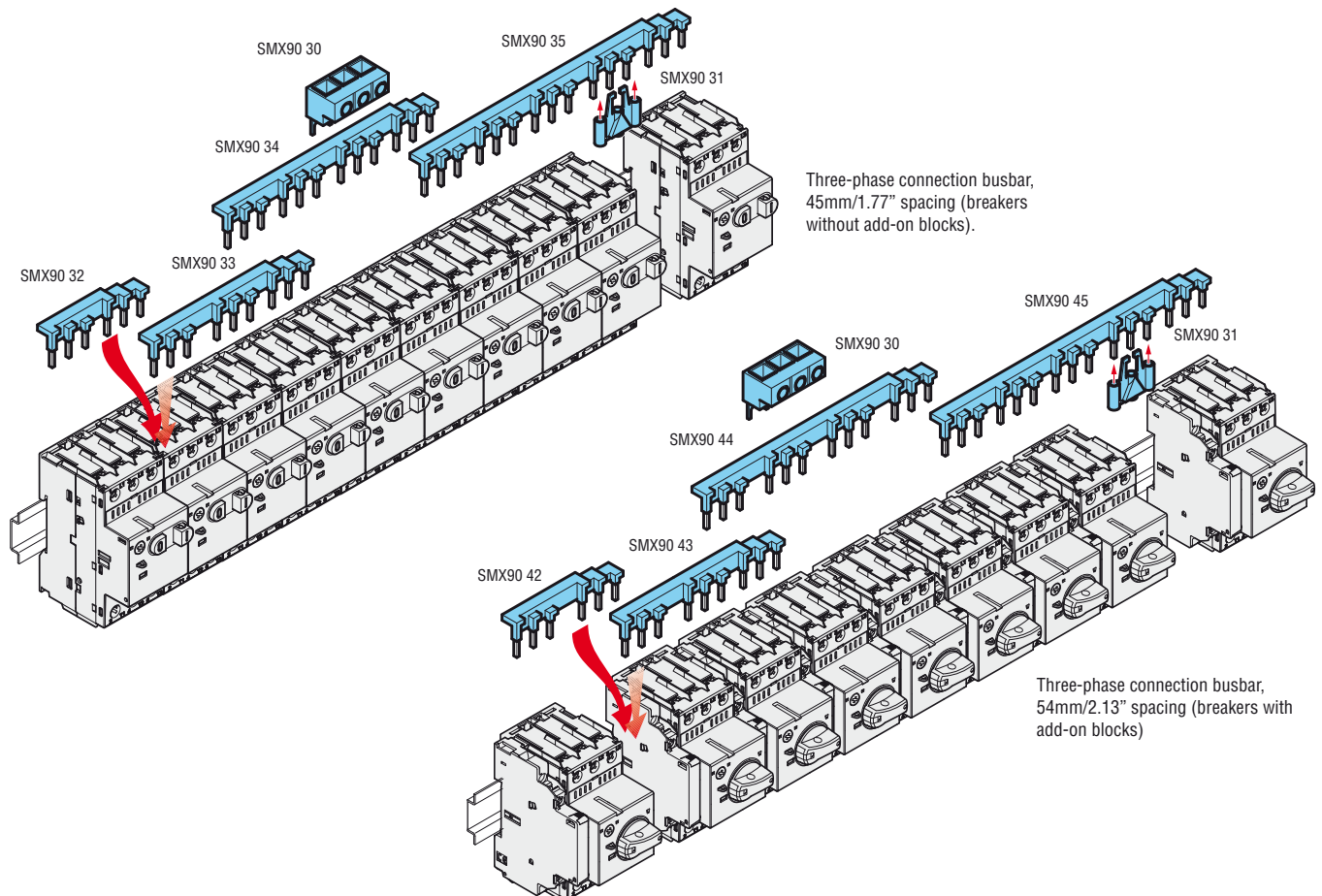
Motor Protection Circuit Breakers  
Add-on blocks and accessories for SM1...



## Combinations

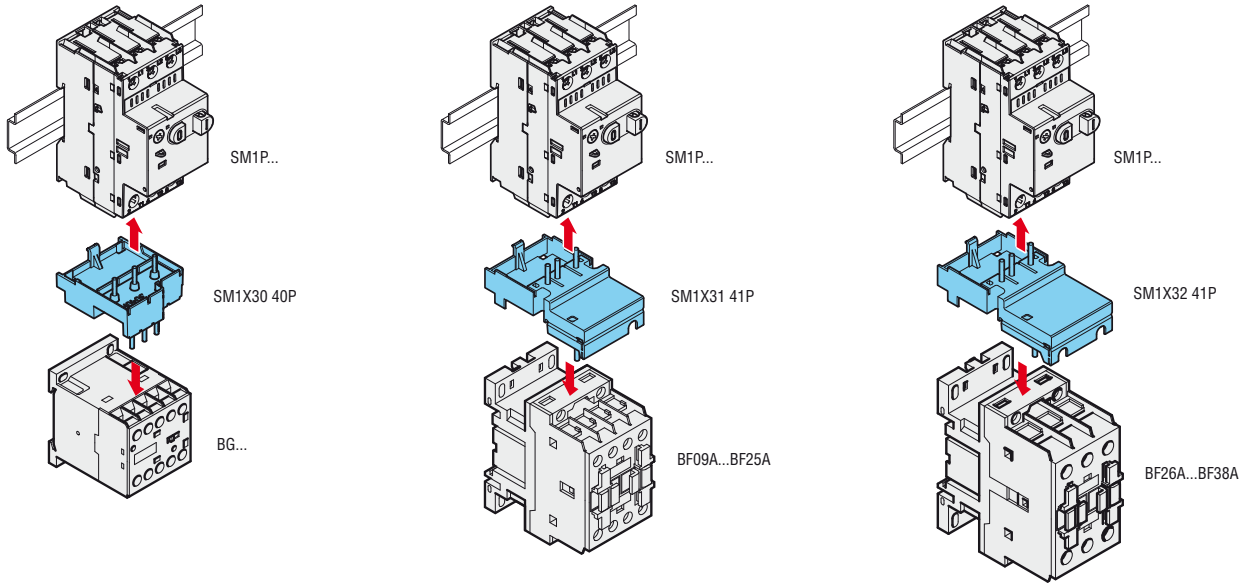


## Three-phase connection busbars.

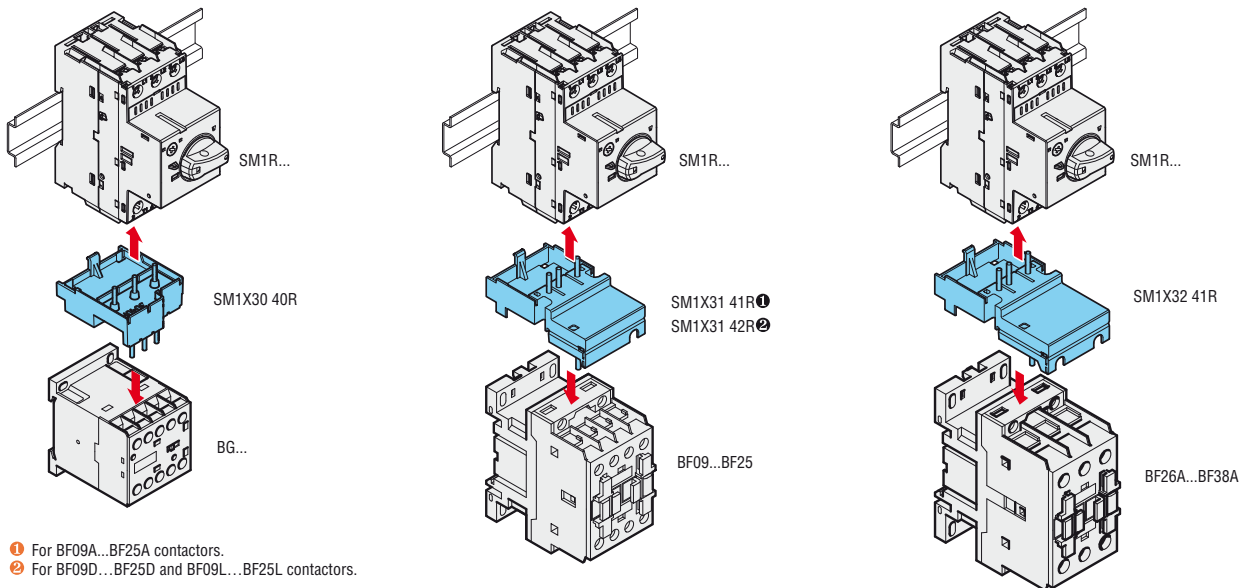


#### Combinations

Rigid SM1P... breaker - contactor connections.

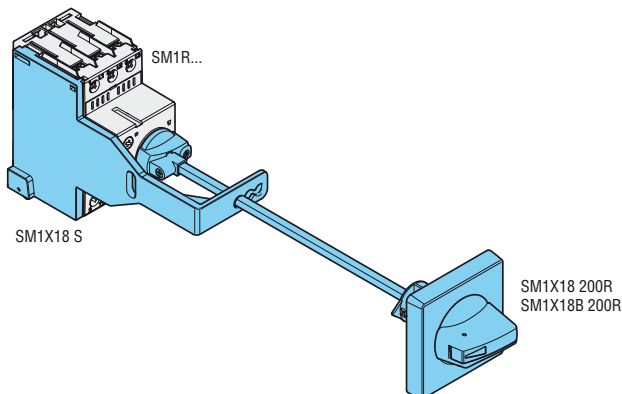


Rigid SM1R... breaker - contactor connections.



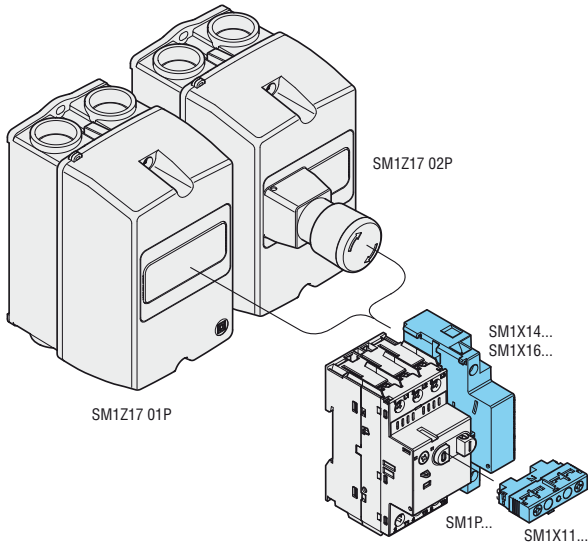
<sup>1</sup> For BF09A...BF25A contactors.  
<sup>2</sup> For BF09D...BF25D and BF09L...BF25L contactors.

Padlockable door coupling handle.

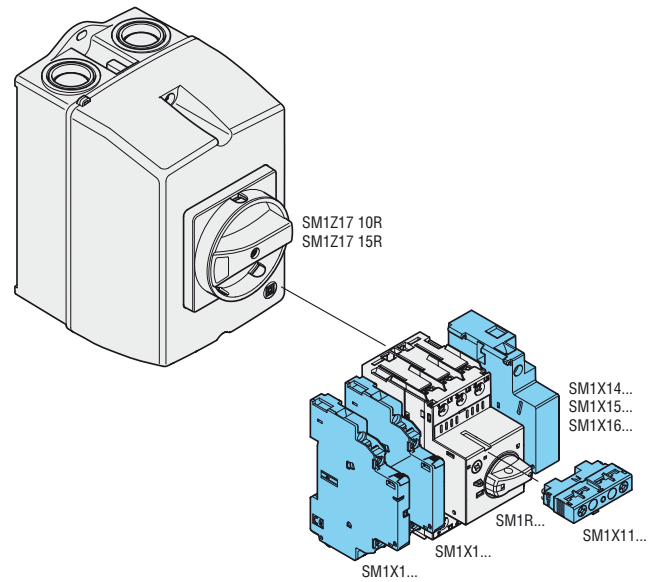


#### Combinations

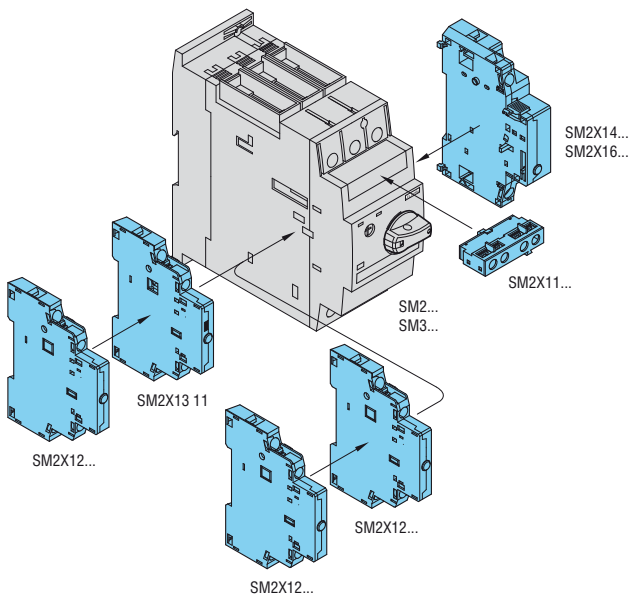
Surface mount enclosures for SM1P... Width 80mm.



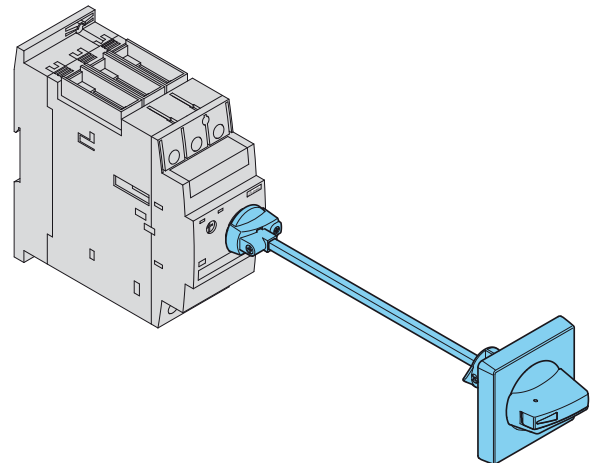
Surface mount enclosures for SM1P... Width 100mm.



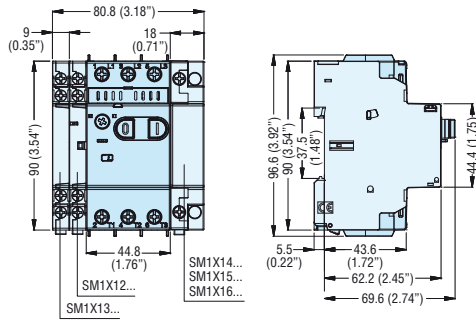
Combinations of SM2... and SM3... motor protection circuit breakers



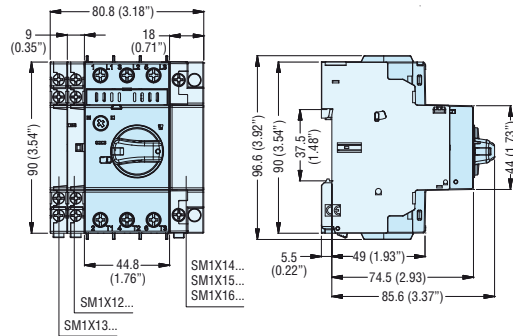
Padlockable door coupling handle.



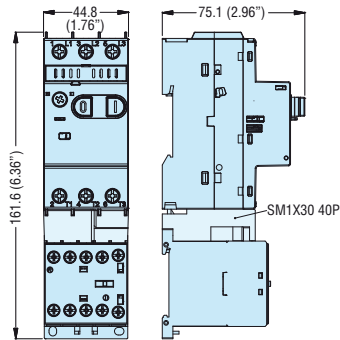
**SM1P... with side-mount auxiliary contacts**



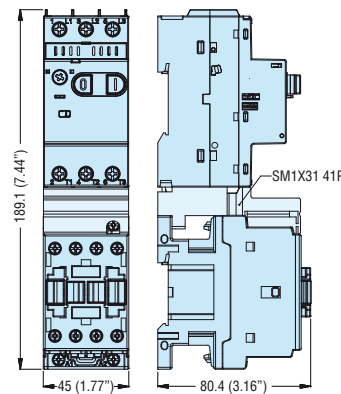
**SM1R... with side-mount auxiliary contacts**



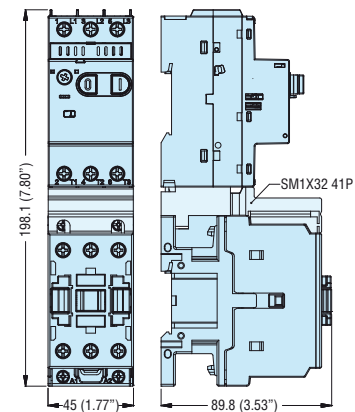
**SM1P... with BG... mini-contacts and connection SM1X30 40P**



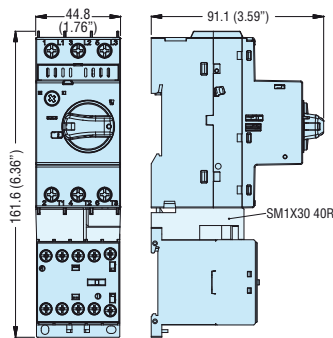
**SM1P... with BF09 A...BF25 A... contactors and connection SM1X31 41P**



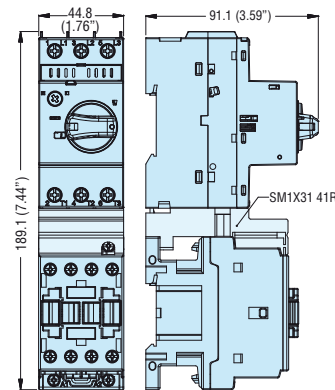
**SM1P... with BF26 A...BF38 A... contactors and connection SM1X32 41P**



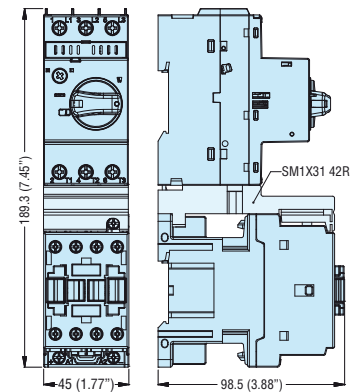
**SM1R... with BG... mini-contacts and connection SM1X30 40R**



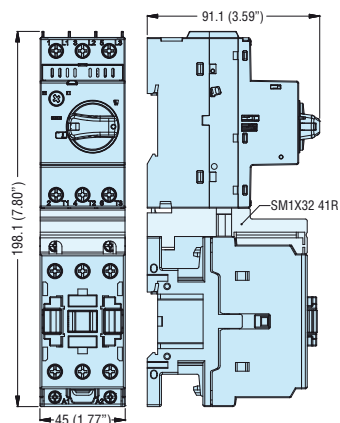
**SM1R... with BF09 A...BF25 A... contactors and connection SM1X31 41R**



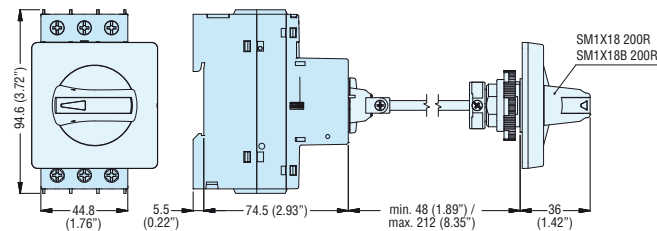
**SM1R... with BF09 D...BF25 D... contactors BF09 L...BF25 L... and connection SM1X31 42R**



**SM1R... with BF26 A...BF38 A... contactors and connection SM1X32 41R**



**SM1R... padlockable door coupling handle SM1X18 200R or SM1X18B 200R**



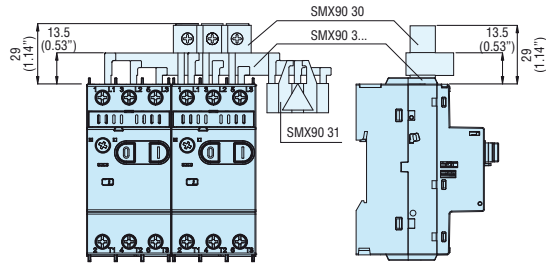
# MOTOR & CIRCUIT PROTECTION

## Motor Protection Circuit Breakers

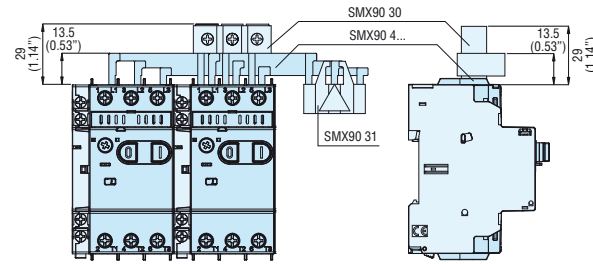
### Dimensions [mm (in)]



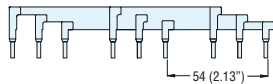
These elements mounted with **SM1... breakers** with no auxiliary contacts



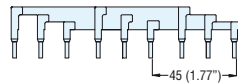
These elements mounted with **SM1... breakers** with auxiliary contacts **SMX12... or SMX13 11**



Connection busbars – 54mm/2.13” spacing  
**SMX90 42 - SMX90 43 - SMX90 44 - SMX90 45**



Connection busbars – 45mm/1.77” spacing  
**SMX90 32 - SMX90 33 - SMX90 34 - SMX90 35**



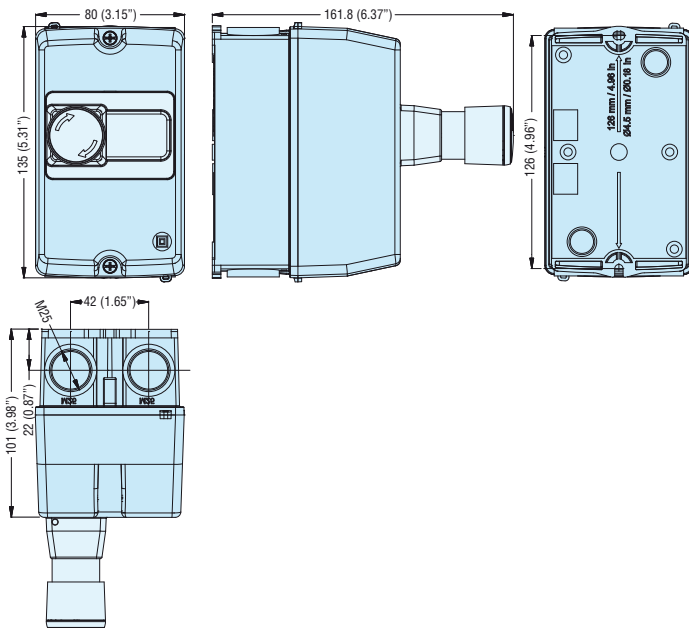
Terminal block for busbar supply **SMX90 30**



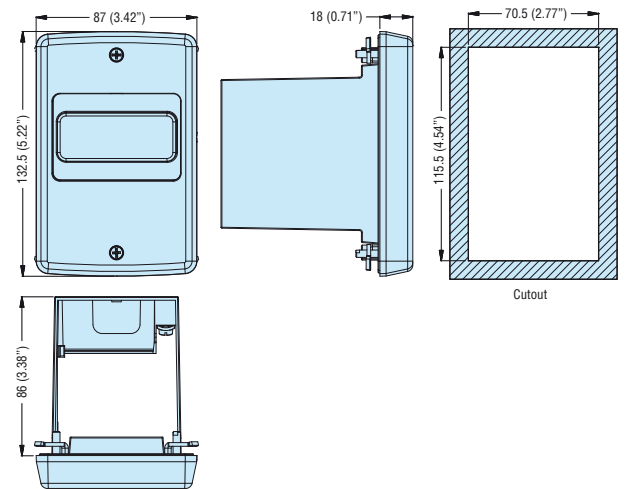
Safety cover **SMX90 31**



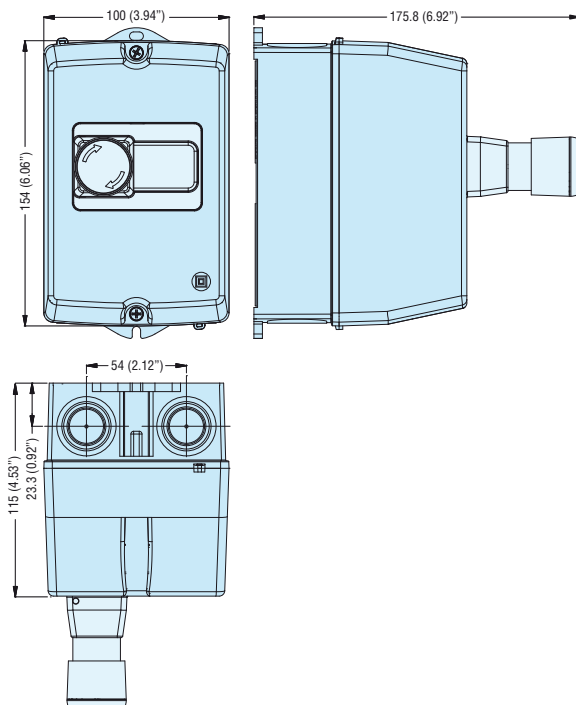
Enclosures **SM1Z17 01P** and **SM1Z17 02P**



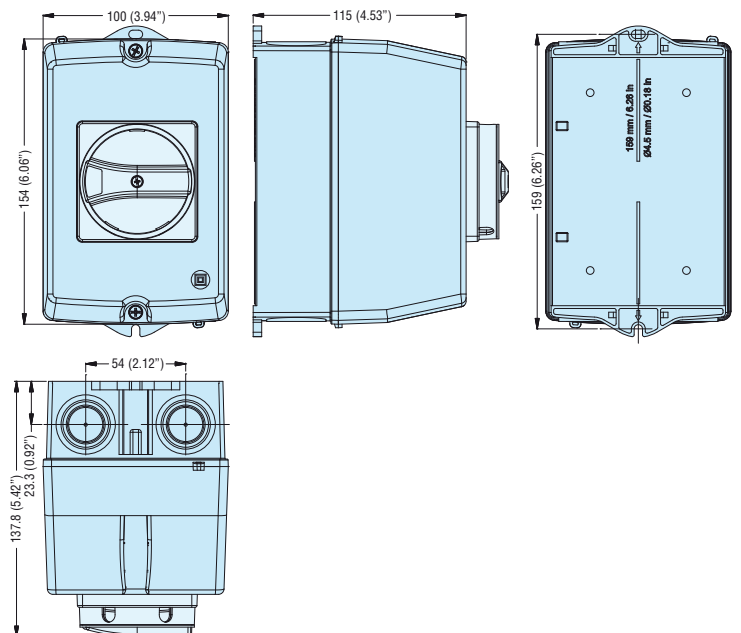
Enclosures **SM1Z17 05P**



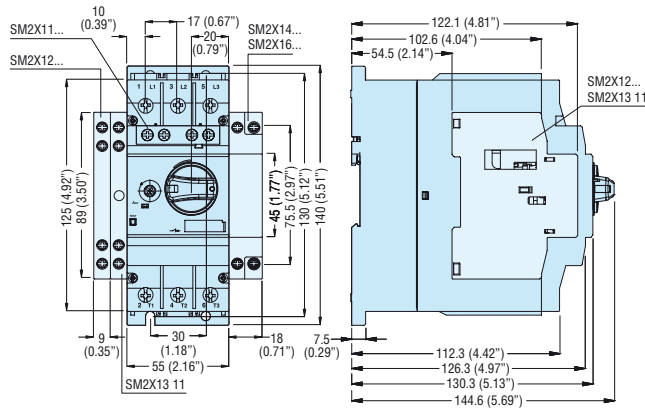
Enclosures **SM1Z17 11P** and **SM1Z17 12P**



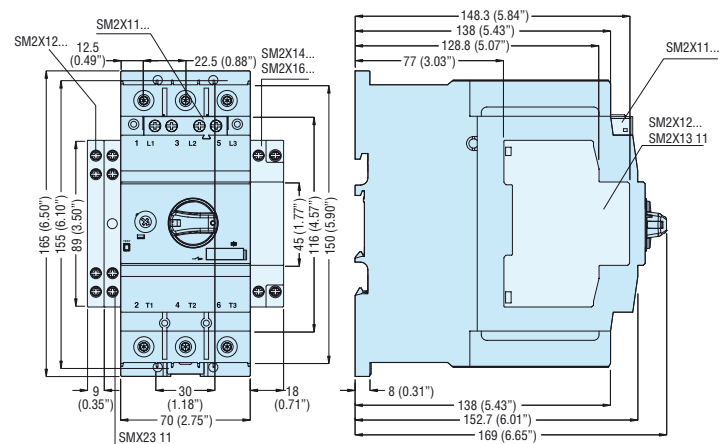
Enclosures **SM1Z17 15R** and **SM1Z17 10R**



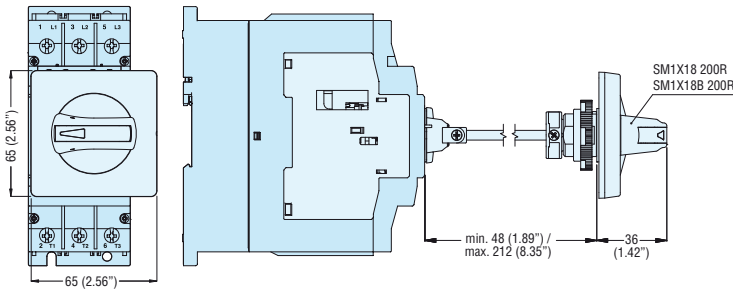
SM2... with side-mount auxiliary contacts



SM3... with side-mount auxiliary contacts



SM2... and SM3... padlockable door coupling handle  
SM1X18 200R or SM1X18B 200R



## WIRING DIAGRAMS

### Motor protection circuit breakers

SM1R... - SM2R... - SM3R...

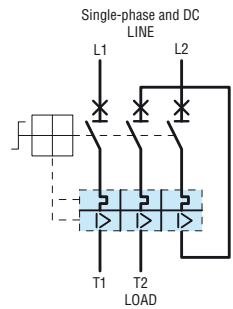
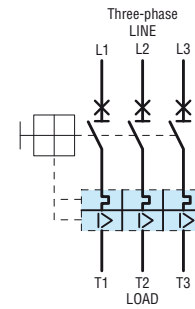
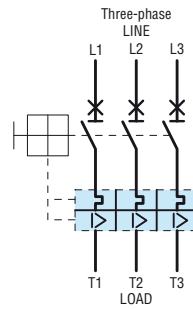
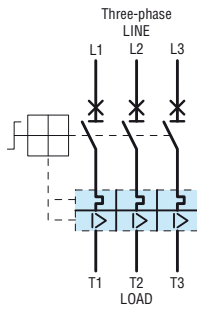
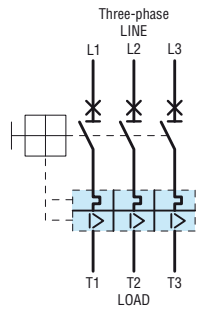
SM1RM...

### Circuit breakers

SM1PF...

For all motor protection circuit breakers

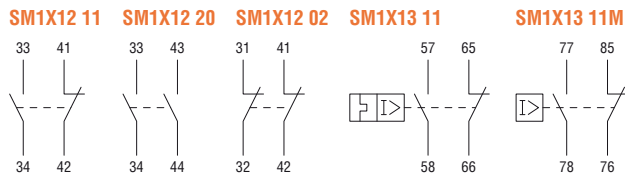
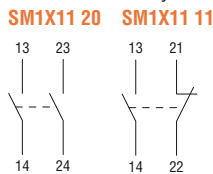
SM1P...



## Add-on blocks

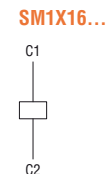
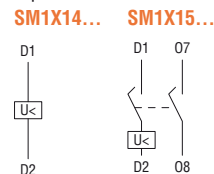
For SM1... types  
Front mount auxiliary contacts

Side-mount auxiliary contacts



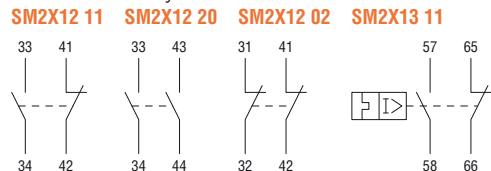
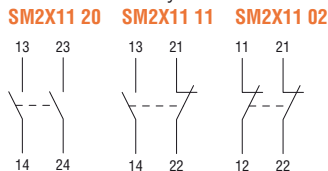
Side mount undervoltage trip releases

Side mount shunt trip release



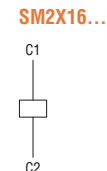
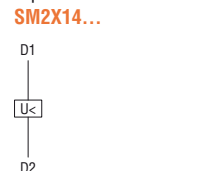
For SM2R... and SM3R types  
Front mount auxiliary contacts

Side-mount auxiliary contacts



Side mount undervoltage trip release

Side mount shunt trip release



TYPE			SM1P...	SM1R...	SM2R...	SM3R...
Rated insulation voltage $U_i$	V		690			
Rated impulse withstand voltage	kV		6			
Rated frequency: 50/60Hz						
Maximum rated current	A		40	40	63	100
Number of adjustment ranges	No.		16①	16	2	3
Total power dissipation	W		6...14	6...14	7.1...20	10...38
Magnetic tripping	A		13 x $I_n$ ①	13 x $I_n$	13 x $I_n$	13 x $I_n$
Mechanical life	cycles		100,000	100,000	50,000	50,000
Electrical life ( $I_e$ max AC3)	cycles		100,000	100,000	25,000	25,000
Maximum terminal tightening torque	Nm		2.5...3	2.5...3	4.5	6
	lbin		1.8...2.2	1.8...2.2	40	53
	Tool		PH2	PH2	PZ2	Hex 4mm
Conductor section minimum and maximum (1 or 2 wires)	AWG	No.	16...8	16...8	18...3	10...1/0
		mm <sup>2</sup>	1...4	1...4	0.75...25	10...50
<b>AMBIENT CONDITIONS</b>						
Temperature	operating	°C	-20...+60②	-20...+60②	-20...+70②	-20...+70②
	storage	°C	-50...+80	-50...+80	-50...+80	-50...+80
	compensation	°C	-20...+50	-20...+50	-5...+40	-5...+40
Maximum altitude		m	3000			
Mounting position			Any			
Fixing			On 35mm DIN rail or screw via accessory		On 35mm DIN rail or screw	

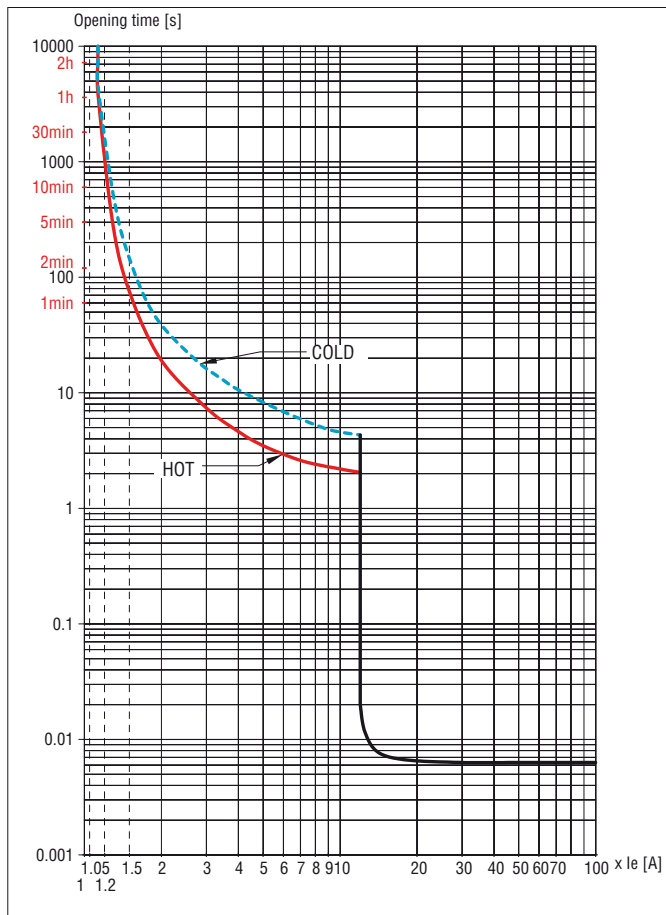
N.B. PH = Phillips; PZ = Pozidriv.

① SM1PF00 20 has a single 0.2A thermal adjustment and magnetic tripping at 6 x  $I_n$  (1.2A).

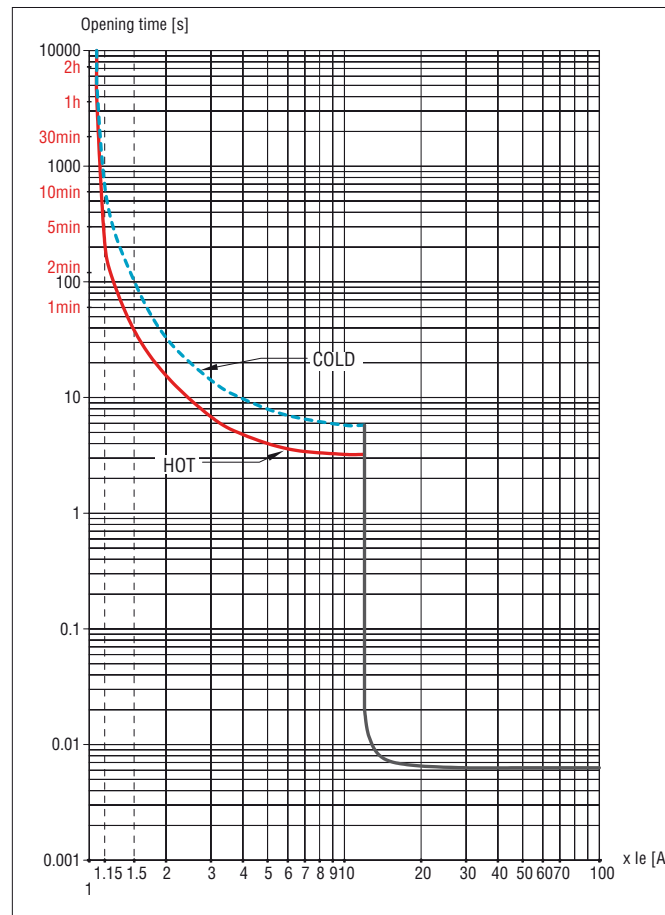
② When more than one breaker are mounted, side by side, without leaving space between each to consent free air circulation on the breaker sides, and have simultaneous operation, the thermal trip adjuster must be positioned at a value 15% greater than the rated motor current.

#### THERMAL TRIPPING CURVE (AVERAGE TIMES)

Balanced operation on 3 phases



Operation on 2 phases (phase failure)



Trip times have a  $\pm 20\%$  dispersion with respect to the average curve indicated in the graph.