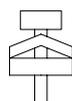
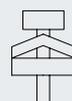
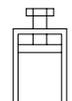
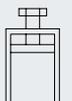


# Manual Motor Starters

## Technical Information

### General data

#### • Terminals

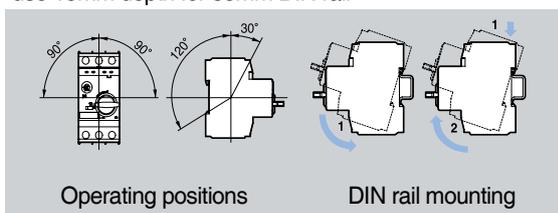
		MMS32S	MMS32H	MMS63S, 63H	MMS100S, 100H
Conformity to standards		IEC60947 UL508, UL508 Type E			
Approvals		CE, UL			
Terminal parts					
Wire					
Single-core	1 conductor	[mm <sup>2</sup> ] / [AWG] 1...10 / 18...8	1...10 / 18...8	0.75...35 / 18...2	2.5...70 / 12...2/0
	2 conductor	[mm <sup>2</sup> ] / [AWG] 1...6 / 18...10	1...6 / 18...10	0.75...25 / 18...4	2.5...50 / 12...1/0
Stranded	1 conductor	[mm <sup>2</sup> ] / [AWG] 1...6 / 18...10	1...6 / 18...10	0.75...35 / 18...2	2.5...70 / 12...2/0
	2 conductor	[mm <sup>2</sup> ] / [AWG] 1...6 / 18...10	1...6 / 18...10	0.75...25 / 18...4	2.5...50 / 12...1/0
Flexible	1 conductor	[mm <sup>2</sup> ] / [AWG] 1...6 / 18...10	1...6 / 18...10	0.75...25 / 18...4	2.5...50 / 12...1/0
	2 conductor	[mm <sup>2</sup> ] / [AWG] 0.75...4 / 18...10	0.75...4 / 18...10	0.75...16 / 18...6	2.5...35 / 10...2
Tightening torque		[Nm] / [lb-in] 0.8...2.5 / 7...22	0.8...2.5 / 7...22	3...4.5 / 26...39	4...6 / 35...53

#### • Power consumption

		MMS32S	MMS32H	MMS63S, 63H	MMS100S, 100H
Total power loss P <sub>v</sub>					
Circuit breaker at rated load operating temperature	[W]	In = 0.16~1.6A : 4.4	In = 0.16~1.6A : 4.4	In = 10~22A : 10.2	In = 17~32A : 15
		In = 2.5~26A : 7.4	In = 2.5~26A : 7.4	In = 26~63A : 9.7	In = 40~63A : 21.8
		In = 32A : 4.0	In = 32A : 4.0		In = 75~100A : 17.8

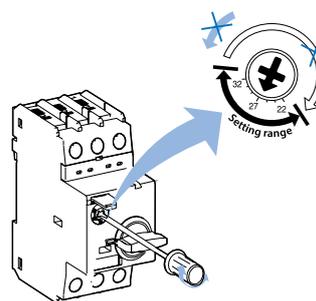
#### • Mounting

- 35mm DIN rail for MMS32~63
- 35mm or 75mm DIN rail for MMS100
- use 15mm depth for 35mm DIN rail



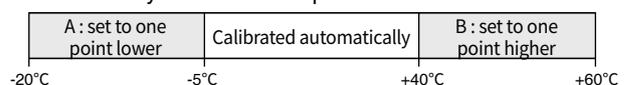
#### • Caution for thermal adjustments

1. Keep the setting range as shown below.
2. Moving counterclockwise out of the setting range may cause the damage of the device.



Dial setting method

3. Calibration by ambient air temperature



In case of using out of the standard air temperature range(-5°C~+40°C) it needs to be calibrated by one point

## • Auxiliaries

		Auxiliary contacts for front mounting FX...		Auxiliary contacts for left side mounting LX...		Alarm switch for left side mounting LA...	
Rated thermal current / th	at 40°C ambient temperature [A]	5		10		10	
	at 60°C ambient temperature [A]	3		6		6	
Contact class coordination according to NEMA (UL/CSA-Standards)	AC	A600		A600		A600	
	DC	Q300		Q300		Q300	
Back-up fuses gG, gL [A]		16		16		16	
Rated supply current	[V]	-	240	24	240	24	240
	AC-15: [A]	-	3	6	4	6	4
	DC-13: [V]	24	220	24	220	24	220
	[A]	1	0.1	2	0.25	2	0.25
Weight (g)		18		30		40	
Terminal parts							
Wire				Pozidriv size 2			
Single-core	1 conductor [mm²] / [AWG]	0.5...2.5 / 20...14		0.5...2.5 / 20...14		0.5...2.5 / 20...14	
	2 conductor [mm²] / [AWG]	-		-		0.5...2.5 / 20...14	
Stranded	1 conductor [mm²] / [AWG]	0.5...4 / 20...10		0.5...4 / 20...10		0.5...4 / 20...10	
	2 conductor [mm²] / [AWG]	0.75...2.5 / 18...14		0.75...2.5 / 18...14		0.75...2.5 / 18...14	
Tightening torque [Nm] / [lb-in]		0.8...1.2 / 7...10		0.8...1.2 / 7...10		0.8...1.2 / 7...10	

		Undervoltage release for right side mounting RU...	Undervoltage release with 2 auxiliary contacts for right side mounting RUX...	Shunt release for right side mounting RS...
Actuating voltage	Pull-in	0.7...1.1×Us	0.85...1.1×Us	0.85...1.1×Us
	Drop-out		0.7...0.35×Us	0.7...0.35×Us
Rated control voltage	min.:	24V 50Hz / 28V 60Hz	24V 50Hz / 28V 60Hz	24V 50Hz / 28V 60Hz
	max.:	415~440V 50Hz / 460~480V 60Hz	415~440V 50Hz / 460~480V 60Hz	415~440V 50Hz / 460~480V 60Hz
Coil rating	Pull-in	8.5VA, 6W	8.5VA, 6W	8.5VA, 6W
	Hold	3VA, 1.2W	3VA, 1.2W	3VA, 1.2W
Opening time (ms)		-	20	20
Weight (g)		18	30	40
Terminal parts				
Wire		Pozidriv size 2		
Single-core	1 conductor [mm²] / [AWG]	0.5...2.5 / 20...14		
	2 conductor [mm²] / [AWG]	0.5...2.5 / 20...14		
Stranded	1 conductor [mm²] / [AWG]	0.5...4 / 20...10		
	2 conductor [mm²] / [AWG]	0.75...2.5 / 18...14		
Tightening torque [Nm] / [lb-in]		0.8...1.2 / 7...10		

# Manual Motor Starters

## Technical Information

### General data

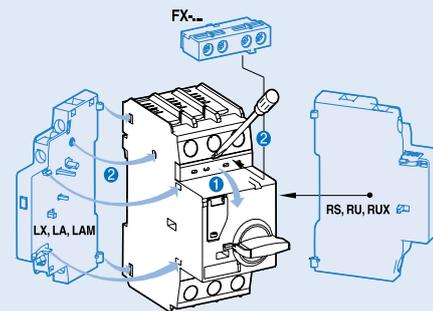
#### • Installation of auxiliaries

Be sure to turn off the main switch of MMS before any other action.

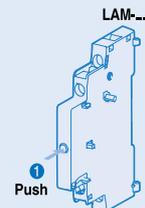


#### MMS-32S/H/Hi

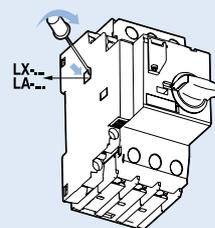
- To install FX remove the cover ① first.
- 2 each of LX can be installed together.
- Only one of auxiliaries among RU, RS and RUX can be mounted on the right side of MMS.
- Do not give trip signal to RS longer than 10 sec.
- Refer to the possible combination chart for the mounting of LX, LA and LAM on left side of MMS.



- Push the trip button before installation of LAM

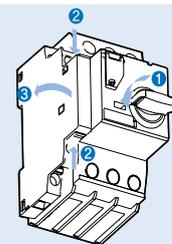


- Remove the indicated part in the fig. before the additional installation of LX



#### Separation of auxiliaries from MMS

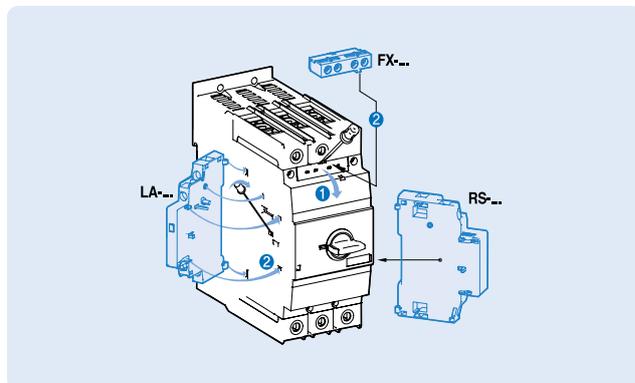
- be sure to turn off the main switch of MMS before the separation.
- push softly the separation button on the side of the auxiliary and pull it.



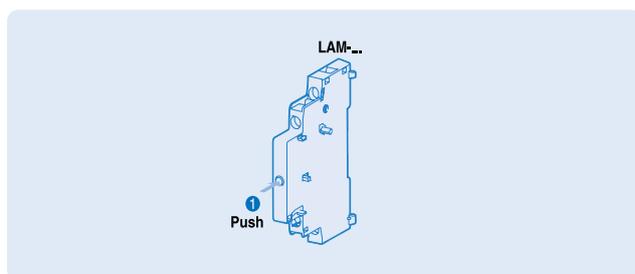
※Please make sure to choose proper LA before use because LA for MMS-32 and MMS-63/100 is different.

### MMS-63, 100S/H/HI

- To install FX remove the cover ① first.
- 2 each of LX can be installed together.  
(only 1 each for MMS-63)
- Only one of auxiliaries among RU, RS and RUX can be mounted on the right side of MMS.
- Do not give trip signal to RS longer than 10 sec.
- Refer to the possible combination chart for the mounting of LX, LA and LAM on left side of MMS.
- Do not use with LA-... (32)  
It is only for MMS-32.



- Push the trip button before installation of LAM



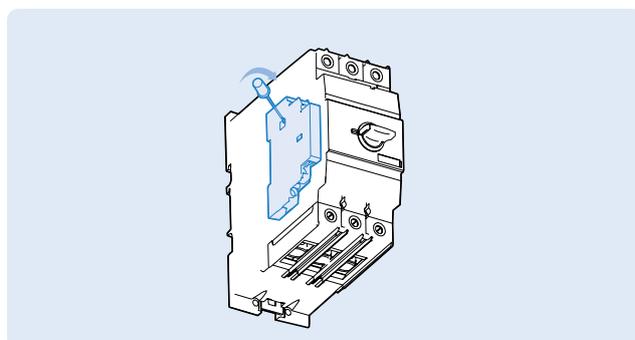
- Do not install LA in the status of TRIP of MMS-100



- Remove the indicated part as shown in the above fig. before the additional installation of LX

### Separation of auxiliaries from MMS

- be sure to turn off the main switch of MMS before the separation.
- push softly the separation button on the side of the auxiliary and pull it.



※Please make sure to choose proper LA before use because LA for MMS-32 and MMS-63/100 is different.

# Manual Motor Starters

## Technical Information

### General data

#### ● Installation of auxiliaries

##### How to Install and reset RUX

###### Installing

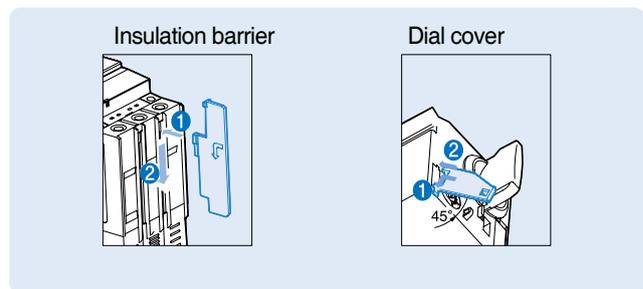
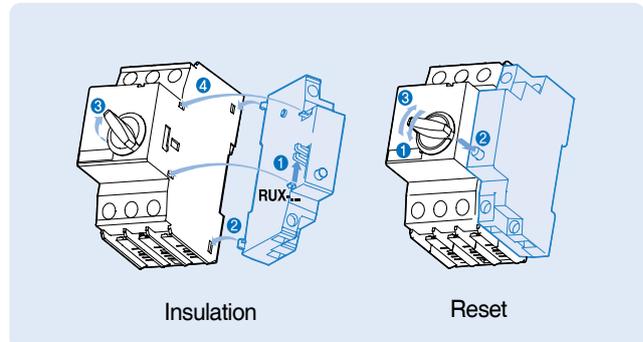
- (1) Check if the trip button of RUX is "UP" .  
If not, push the side lever ① to come it up.
- (2) Fit the both lower hooks ② into the MMS.
- (3) Rotate the handle of MMS to the 20 to 30 degree ③ to ON direction and keep it.
- (4) Fit the both upper hooks ④ into the MMS.
- (5) Input power to the RUX.
- (6) Turn ON the handle of MMS.

###### Resetting

The trip button of RUX does not come "UP" in the event of tripping due to undervoltage.

To turn ON the MMS after the tripping

- ① turn OFF the MMS and check if the trip button of RUX comes "UP" .
- ② push the trip button
- ③ turn ON the MMS

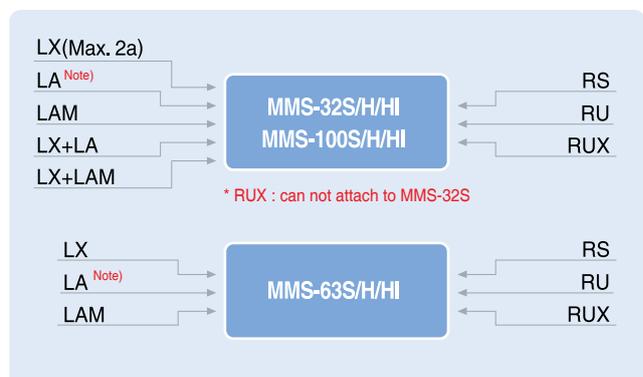
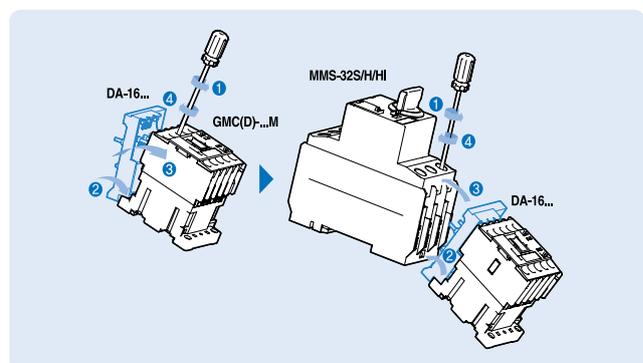


\* Only for MMS-100

\* For all MMS

#### Combination with mini contactors

Adaptor	MMS	+ Contactor model
DA-16SA	MMS-32S	+ GMC-6M-16M
DA-16SD	MMS-32S	+ GMD-6M-16M
DA-16HA	MMS-32H, 32HI	+ GMC-6M-16M
DA-16HD	MMS-32H, 32HI	+ GMD-6M-16M
DA-18SA	MMS-32S	+ MC-6a-18a
DA-18SD	MMS-32S	+ MC-6a-18a DC
DA-18HA	MMS-32H	+ MC-6a-18a
DA-18HD	MMS-32H	+ MC-6a-18a DC
DA-22SA	MMS-32S	+ MC-9b-22b
DA-22SD	MMS-32S	+ MC-9b-22b DC
DA-22HA	MMS-32H, 32HI	+ MC-9b-22b
DA-22HD	MMS-32H, 32HI	+ MC-9b-22b DC
DA-32SA	MMS-32S	+ MC-9-32(32a, 40a)
DA-32SD	MMS-32S	+ MC-9-32(32a, 40a) DC
DA-32HA	MMS-32H, 32HI	+ MC-9-32(32a, 40a)
DA-32HD	MMS-32H, 32HI	+ MC-9-32(32a, 40a) DC
DA-63A	MMS-63S, 63H, 63HI	+ MC-35-63(50a, 65a)
DA-63D	MMS-63S, 63H, 63HI	+ MC-35-63(50a, 65a) DC
DA-95A	MMS-100S, 100H, 100HI	+ MC-65-95(75a, 85a, 100a) / Lug Type Only
DA-95D	MMS-100S, 100H, 100HI	+ MC-65-95(75a, 85a, 100a) DC / Lug Type Only



Note) LA(32 on 63/100 is a sparate).

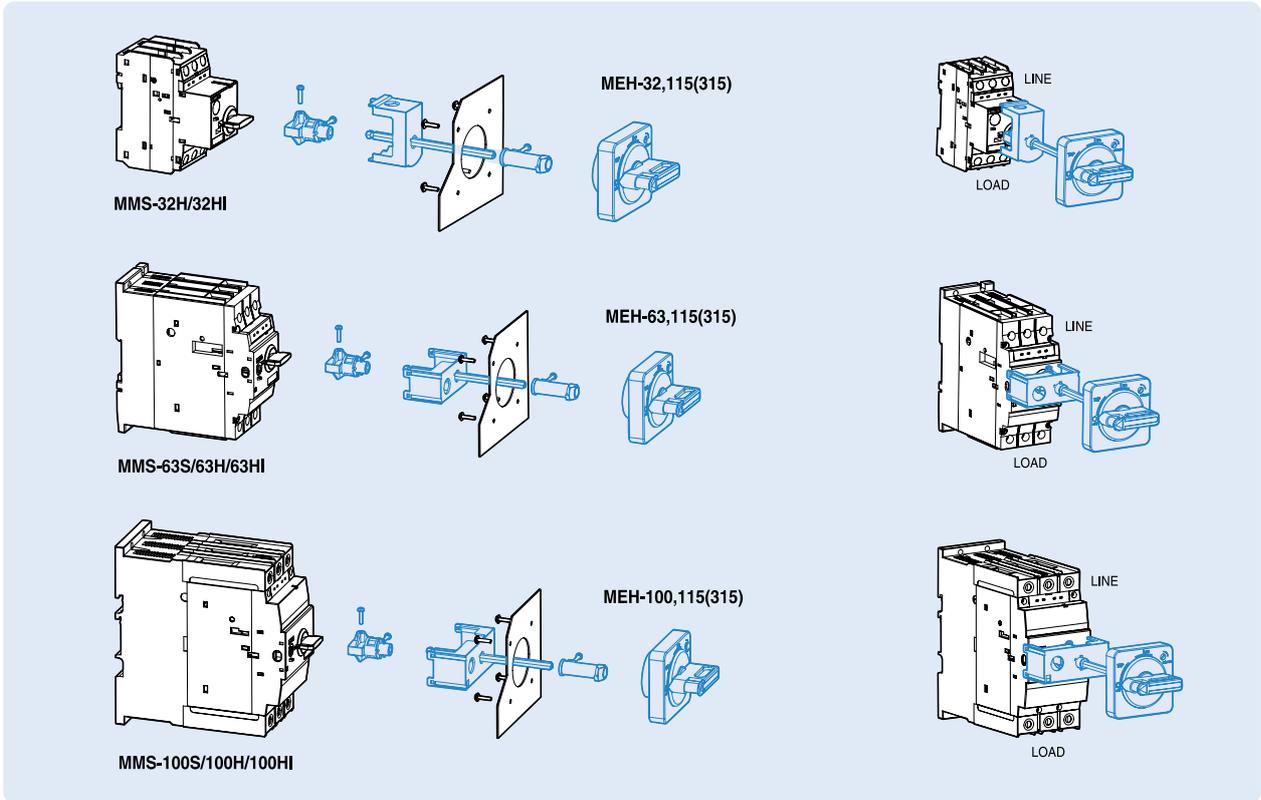
#### Possible combination chart

Please read this chart completely before installing the auxiliaries.

Improper combination can cause electric failure or accident.

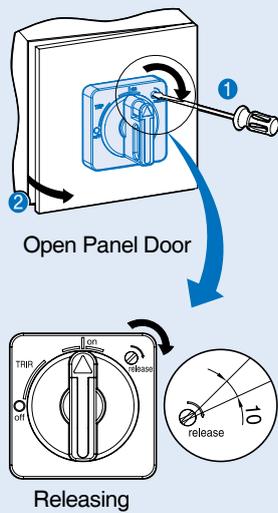
● E-Handle

Structure



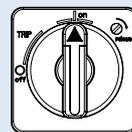
Locking Device

When opening the panel door at ON position

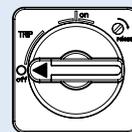


Locking  
Installation at OF, OFF position

1 Setting to regular position through turning the handle

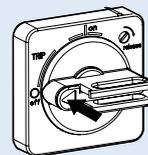


On Position  
(Vertical State)

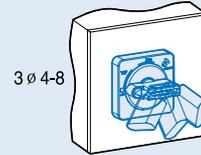


Off Position  
(Horizontal State)

2 Pushing



3 Locking



# Manual Motor Starters

## Technical Information

### General data

#### • E-Handle

##### Installation

Projection should be passed through the hole when assembling

Projection should be passed through the hole when assembling

MEH-32/63/100

MEH-32

MEH-63/100

MEH-32

MEH-63/100

'Click'

'Click'

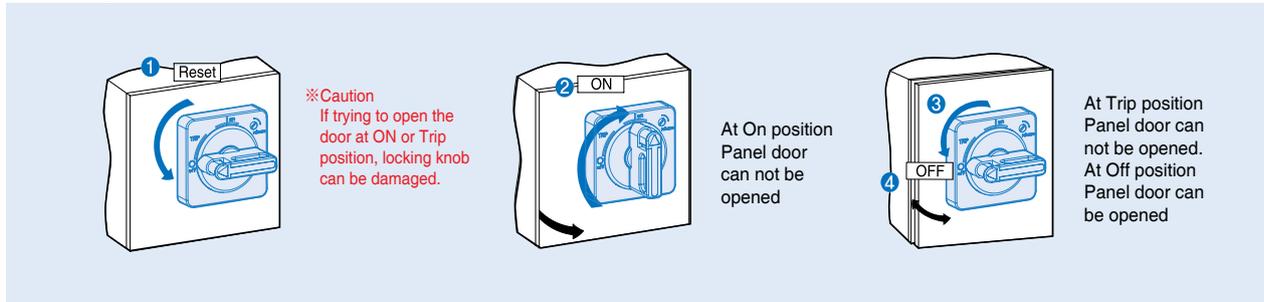
'Click'

'Click'

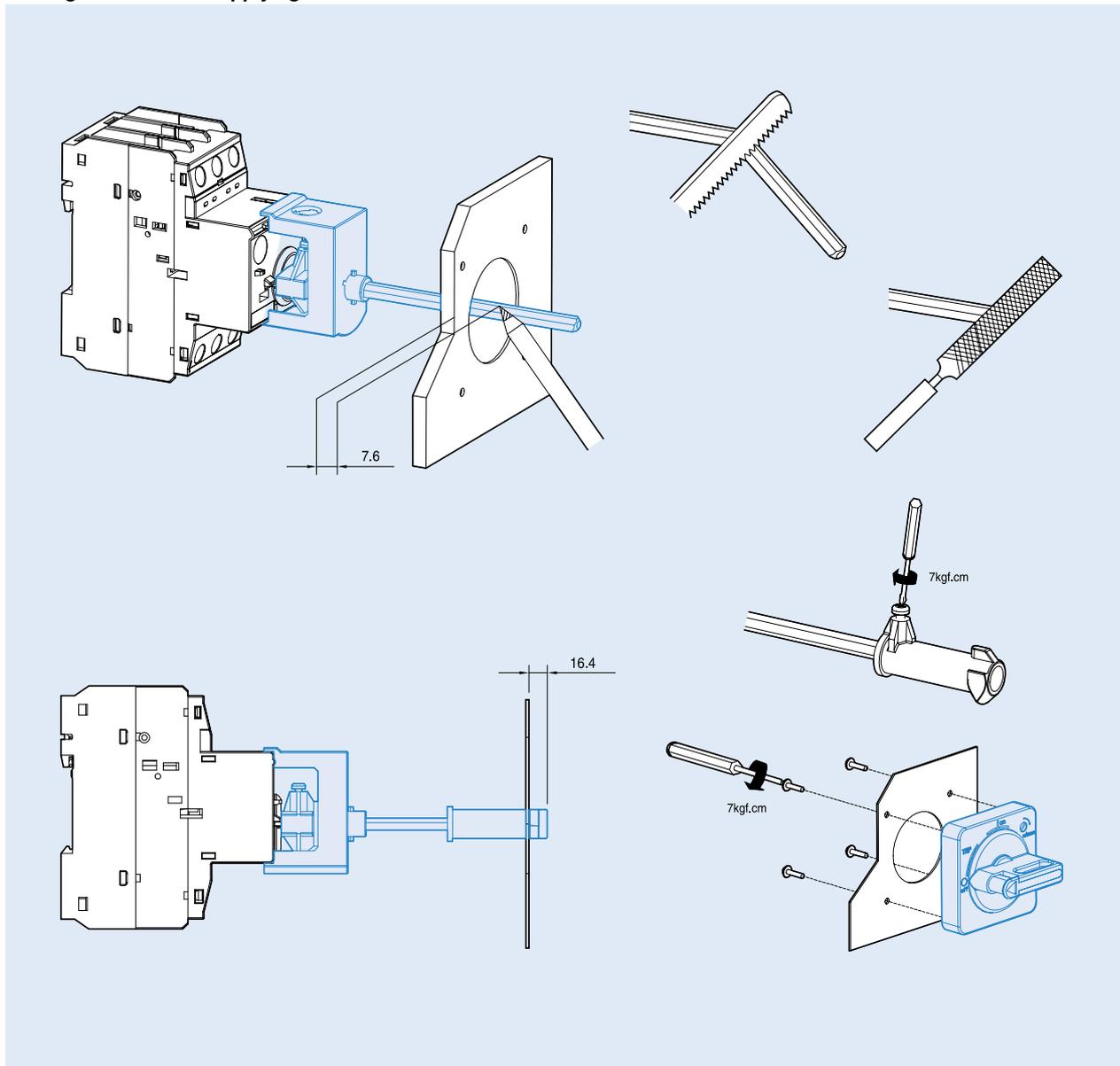
Caution

Restricted fact of Assembling  
Assembling is available for MMS-63/100 with 4 holes on the main cover which is produced after June, 2007 based on manufacturing date.

## Operating Test



## Cutting off the shaft & applying the handle

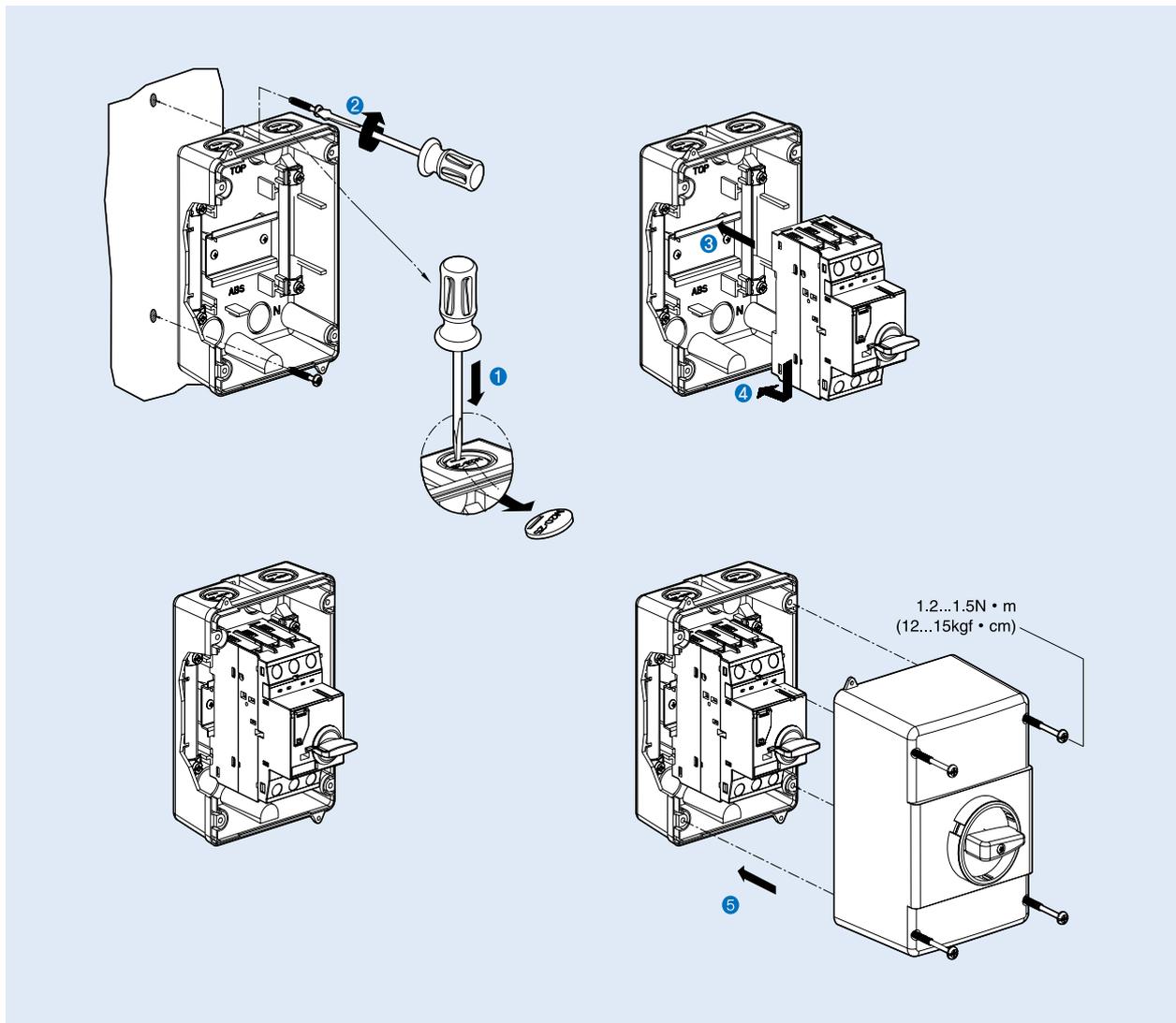


# Manual Motor Starters

## Technical Information

### General data

#### • Enclosure



## IEC performance data (Motor protection)

### Standard type

#### • MMS 32S

Rated operational current $I_e$ [A]	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32	40
<b>Switching of standard three-phase motors</b>																	
AC-2, AC-3																	
230/240V [kW]	-	0.03	0.06	0.09	0.12	0.18/0.25	0.37	0.55/0.75	1.1/1.5	1.5	2.2/3	3	3.7/4	4	5.5	7.5	7.5
400/415V [kW]	0.02	0.06	0.09	0.12	0.18/0.25	0.37/0.55	0.75	1.1/1.5	2.2	3	3.7/4	5.5	7.5	7.5	11	15	18.5
500V [kW]	-	-	-	0.25	0.37	0.55/0.75	1.1	1.5/2.2	3	3.7	4/5.5	7.5	11	11	15	18.5	22
690V [kW]	-	-	-	0.25	0.37/0.55	0.75/1.1	1.5	2.2/3	3.7/4	5.5	7.5	11	11	15	18.5	22	30
<b>Back-up fuses</b>																	
gG, gL,, only if $I_{cc} > I_{cu}$																	
(* = No back up fuse required)																	
230/240V [kA]	*	*	*	*	*	*	*	*	*	*	*	*	*	125	125	125	160
400/415V [kA]	*	*	*	*	*	*	*	*	*	*	80	80	100	100	100	100	125
440/460V [kA]	*	*	*	*	*	*	*	50	50	63	63	80	80	100	100	100	100
500V [kA]	*	*	*	*	*	*	50	40	50	63	63	80	80	80	80	80	80
690V [kA]	*	*	*	*	*	20	35	40	50	63	63	63	63	63	63	63	63
<b>Ultimate short-circuit breaking capacity <math>I_{cu}</math></b>																	
230/240V [kA]	100	100	100	100	100	100	100	100	100	100	100	100	50	40	40	30	20
400/415V [kA]	100	100	100	100	100	100	100	100	100	100	50	50	20	15	15	15	10
440/460V [kA]	100	100	100	100	100	100	100	50	15	15	15	10	10	8	8	6	5
500V [kA]	100	100	100	100	100	100	50	15	10	10	6	6	6	6	6	5	4
690V [kA]	100	100	100	100	100	3	3	3	3	3	3	3	3	3	3	3	2
<b>Rated service short-circuit breaking capacity <math>I_{cs}</math></b>																	
230/240V [kA]	100	100	100	100	100	100	100	100	100	100	100	100	38	30	30	22	15
400/415V [kA]	100	100	100	100	100	100	100	100	100	100	38	38	15	11	11	11	8
440/460V [kA]	100	100	100	100	100	100	100	38	11	11	11	8	8	6	6	4	3
500V [kA]	100	100	100	100	100	100	38	11	8	8	5	5	5	5	5	4	3
690V [kA]	100	100	100	100	100	3	3	3	3	3	3	3	3	3	3	3	2

#### • MMS 63S

Rated operational current $I_e$ [A]	10	13	17	22	26	32	40	50	63	65
<b>Switching of standard three-phase motors</b>										
AC-2, AC-3										
230/240V [kW]	2.2/3	3	3.7/4	4	5.5	7.5	7.5	11	15	15
400/415V [kW]	3.7/4	5.5	7.5	7.5	11	15	18.5	22	30	30
500V [kW]	4/5.5	7.5	11	11	15	18.5	22	30	37	37
690V [kW]	7.5	11	11	15	18.5	22	30	45	55	55
<b>Back-up fuses</b>										
gG, gL,, only if $I_{cc} > I_{cu}$										
(* = No back up fuse required)										
230/240V [kA]	*	*	*	125	125	160	160	160	200	200
400/415V [kA]	*	80	100	125	125	125	125	160	160	180
440/460V [kA]	80	80	100	100	100	100	100	100	125	125
500V [kA]	80	80	80	80	80	80	80	80	80	80
690V [kA]	63	63	63	63	63	63	63	63	80	60
<b>Ultimate short-circuit breaking capacity <math>I_{cu}</math></b>										
230/240V [kA]	100	100	100	50	50	50	50	50	50	50
400/415V [kA]	100	50	25	25	25	25	25	25	25	25
440/460V [kA]	15	10	10	10	10	10	10	10	10	10
500V [kA]	10	6	6	6	6	6	6	6	6	6
690V [kA]	4	4	4	4	4	4	4	4	4	4
<b>Rated service short-circuit breaking capacity <math>I_{cs}</math></b>										
230/240V [kA]	100	100	100	38	38	38	38	38	38	38
400/415V [kA]	100	38	19	19	19	19	19	19	19	19
440/460V [kA]	12	8	8	8	8	8	8	8	8	8
500V [kA]	8	5	5	5	5	5	5	5	5	5
690V [kA]	3	3	3	3	3	3	3	3	3	3

# Manual Motor Starters

## Technical Information

### IEC performance data (Motor protection)

#### Standard type

##### • MMS 100S

Rated operational current I <sub>e</sub> [A]		17	22	26	32	40	50	63	75	90	100
<b>Switching of standard three-phase motors</b> AC-2, AC-3											
230/240V [kW]		3.7/4	4	5.5	7.5	7.5	11	15	22	30	30
400/415V [kW]		7.5	7.5	11	15	18.5	22	30	37	45	45
500V [kW]		11	11	15	18.5	22	30	37	45	55	63
690V [kW]		11	15	18.5	22	30	45	55	63	75	90
<b>Back-up fuses</b> gG, gL, only if I <sub>cc</sub> >I <sub>cu</sub> (* = No back up fuse required)											
230/240V [kA]		*	*	*	*	*	*	*	*	*	*
400/415V [kA]		100	125	125	125	160	160	160	160	160	160
440/460V [kA]		100	125	125	125	125	125	160	160	160	160
500V [kA]		100	100	100	100	100	100	100	125	125	125
690V [kA]		63	80	80	80	80	80	80	100	125	125
<b>Ultimate short-circuit breaking capacity I<sub>cu</sub></b>											
230/240V [kA]		100	100	100	100	100	100	100	100	100	100
400/415V [kA]		50	50	50	50	50	50	50	50	50	50
440/460V [kA]		40	40	40	40	40	40	40	40	40	40
500V [kA]		25	25	25	15	15	12	12	8	8	8
690V [kA]		10	10	10	10	6	6	6	5	5	5
<b>Rated service short-circuit breaking capacity I<sub>cs</sub></b>											
230/240V [kA]		100	100	100	100	100	100	100	100	100	100
400/415V [kA]		38	38	38	38	38	38	38	38	38	38
440/460V [kA]		30	30	30	30	30	30	30	30	30	30
500V [kA]		19	19	19	11	11	9	9	6	6	6
690V [kA]		8	8	8	8	5	5	5	4	4	4

#### High breaking type

##### • MMS 32H

Rated operational current I <sub>e</sub> [A]		0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32	40
<b>Switching of standard three-phase motors</b> AC-2, AC-3																		
230/240V [kW]		-	0.03	0.06	0.09	0.12	0.18/0.25	0.37	0.55/0.75	1.1/1.5	1.5	2.2/3	3	3.7/4	4	5.5	7.5	7.5
400/415V [kW]		0.02	0.06	0.09	0.12	0.18/0.25	0.37/0.55	0.75	1.1/1.5	2.2	3	3.7/4	5.5	7.5	7.5	11	15	1.8
500V [kW]		-	-	-	0.25	0.37	0.55/0.75	1.1	1.5/2.2	3	3.7	4/5.5	7.5	11	11	15	18.5	22
690V [kW]		-	-	-	0.25	0.37/0.55	0.75/1.1	1.5	2.2/3	3.7/4	5.5	7.5	11	11	15	18.5	22	30
<b>Back-up fuses</b> gG, gL, only if I <sub>cc</sub> >I <sub>cu</sub> (* = No back up fuse required)																		
230/240V [kA]		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
400/415V [kA]		*	*	*	*	*	*	*	*	*	*	*	100	125	125	125	160	
440/460V [kA]		*	*	*	*	*	*	*	*	80	80	80	80	100	100	100	125	
500V [kA]		*	*	*	*	*	*	*	*	63	80	80	80	80	80	80	100	
690V [kA]		*	*	*	*	*	35	40	50	63	63	63	63	63	63	63	80	
<b>Ultimate short-circuit breaking capacity I<sub>cu</sub></b>																		
230/240V [kA]		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
400/415V [kA]		100	100	100	100	100	100	100	100	100	100	100	100	50	50	50	50	40
440/460V [kA]		100	100	100	100	100	100	100	100	100	50	50	50	20	20	20	20	15
500V [kA]		100	100	100	100	100	100	100	100	100	50	50	42	10	10	10	10	8
690V [kA]		100	100	100	100	100	100	8	8	6	6	6	6	4	4	4	4	3
<b>Rated service short-circuit breaking capacity I<sub>cs</sub></b>																		
230/240V [kA]		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
400/415V [kA]		100	100	100	100	100	100	100	100	100	100	100	100	38	38	38	38	30
440/460V [kA]		100	100	100	100	100	100	100	100	100	38	38	38	15	15	15	15	11
500V [kA]		100	100	100	100	100	100	100	100	100	38	38	32	8	8	8	8	6
690V [kA]		100	100	100	100	100	100	8	8	6	6	6	6	4	4	4	4	3

Note) \* = Short circuit proof up to 50 or 100kA. No back up fuse required.

## High breaking type

### • MMS 63H



Rated operational current $I_e$ [A]	10	13	17	22	26	32	40	50	63	65
<b>Switching of standard three-phase motors</b>										
AC-2, AC-3										
230/240V [kW]	2.2/3	3	3.7/4	4	5.5	7.5	7.5	11	15	15
400/415V [kW]	3.7/4	5.5	7.5	7.5	11	15	18.5	22	30	30
500V [kW]	4/5.5	7.5	11	11	15	18.5	22	30	37	37
690V [kW]	7.5	11	11	15	18.5	22	30	45	55	55
<b>Back-up fuses</b>										
gG, gL <sub>2</sub> , only if $I_{cc} > I_{cu}$ (* = No back up fuse required)										
230/240V [kA]	*	*	*	*	*	*	*	*	*	*
400/415V [kA]	*	*	100	125	125	125	160	160	160	160
440/460V [kA]	100	100	100	125	125	125	125	125	160	160
500V [kA]	100	100	100	100	100	100	100	100	100	100
690V [kA]	63	63	63	80	80	80	80	80	80	80
<b>Ultimate short-circuit breaking capacity <math>I_{cu}</math></b>										
230/240V [kA]	100	100	100	100	100	100	100	100	100	75
400/415V [kA]	100	100	50	50	50	50	50	50	50	35
440/460V [kA]	50	50	50	50	35	35	35	35	35	25
500V [kA]	50	42	12	12	12	10	10	10	10	6
690V [kA]	6	6	5	5	5	5	5	5	5	3
<b>Rated service short-circuit breaking capacity <math>I_{cs}</math></b>										
230/240V [kA]	100	100	100	100	100	100	100	100	100	50
400/415V [kA]	100	100	50	50	50	50	50	50	50	27
440/460V [kA]	38	38	38	38	27	27	27	27	27	19
500V [kA]	38	32	9	9	9	8	8	8	8	5
690V [kA]	5	5	5	5	5	5	5	5	5	3

Note) \* = Short circuit proof up to 50 or 100kA. No back up fuse required.

### • MMS 100H



Rated operational current $I_e$ [A]	17	22	26	32	40	50	63	75	90	100
<b>Switching of standard three-phase motors</b>										
AC-2, AC-3										
230/240V [kW]	3.7/4	4	5.5	7.5	7.5	11	15	22	30	30
400/415V [kW]	7.5	7.5	11	15	18.5	22	30	37	45	45
500V [kW]	11	11	15	18.5	22	30	37	45	55	63
690V [kW]	11	15	18.5	22	30	45	55	63	75	90
<b>Back-up fuses</b>										
gG, gL <sub>2</sub> , only if $I_{cc} > I_{cu}$ (* = No back up fuse required)										
230/240V [kA]	*	*	*	*	*	*	*	*	*	*
400/415V [kA]	*	*	*	*	*	*	*	*	*	*
440/460V [kA]	125	125	125	160	160	160	200	200	200	200
500V [kA]	100	125	125	125	160	160	160	160	160	160
690V [kA]	80	80	80	80	80	100	100	125	160	160
<b>Ultimate short-circuit breaking capacity <math>I_{cu}</math></b>										
230/240V [kA]	100	100	100	100	100	100	100	100	100	100
400/415V [kA]	100	100	100	100	100	100	100	75	75	75
440/460V [kA]	50	50	50	50	50	50	50	50	50	50
500V [kA]	35	35	35	25	20	15	15	12	12	12
690V [kA]	12	12	12	12	12	10	8	6	6	6
<b>Rated service short-circuit breaking capacity <math>I_{cs}</math></b>										
230/240V [kA]	100	100	100	100	100	100	100	100	100	100
400/415V [kA]	100	50	50	50	50	50	50	50	50	50
440/460V [kA]	38	38	38	38	38	38	38	38	38	38
500V [kA]	27	27	27	19	15	11	11	9	9	9
690V [kA]	9	9	9	9	9	8	6	6	6	6

Note) \* = Short circuit proof up to 50 or 100kA. No back up fuse required.

# Manual Motor Starters

## Technical Information

### IEC performance data (Motor protection)

#### High breaking type

##### • MMS 32HI

Rated operational current $I_e$ [A]	[A]	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32	40	
AC-2, AC-3																			
230/240V	[kW]	-	0.03	0.06	0.09	0.12	0.18/0.25	0.37	0.55/0.75	1.1/1.5	1.5	2.2/3	3	3.7/4	4	5.5	7.5	7.5	7.5
400/415V	[kW]	0.02	0.06	0.09	0.12	0.18/0.25	0.37/0.55	0.75	1.1/1.5	2.2	3	3.7/4	5.5	7.5	7.5	11	15	15	18.5
500V	[kW]	-	-	-	0.25	0.37	0.55/0.75	1.1	1.5/2.2	3	3.7	4/5.5	7.5	11	11	15	18.5	22	22
690V	[kW]	-	-	-	0.25	0.37/0.55	0.75/1.1	1.5	2.2/3	3.7/4	5.5	7.5	11	11	15	18.5	22	30	30
Back-up fuses gG, gL, only if $I_{cc} > I_{cu}$ (* = No back up fuse required)																			
230/240V	[kA]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
400/415V	[kA]	*	*	*	*	*	*	*	*	*	*	*	*	*	100	125	125	160	160
440/460V	[kA]	*	*	*	*	*	*	*	*	*	80	80	80	100	100	100	100	125	125
500V	[kA]	*	*	*	*	*	*	*	*	*	63	80	80	80	80	80	80	80	80
690V	[kA]	*	*	*	*	*	*	35	40	50	63	63	63	63	63	63	63	63	80
Ultimate short-circuit breaking capacity $I_{cu}$																			
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	100	50	50	50	50	40
440/460V	[kA]	100	100	100	100	100	100	100	100	100	50	50	50	20	20	20	20	15	15
500V	[kA]	100	100	100	100	100	100	100	100	100	50	50	42	10	10	10	10	8	8
690V	[kA]	100	100	100	100	100	100	8	8	6	6	6	6	4	4	4	4	3	3
Rated service short-circuit breaking capacity $I_{cs}$																			
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	38	38	38	38	30	30
440/460V	[kA]	100	100	100	100	100	100	100	100	100	38	38	38	15	15	15	15	11	11
500V	[kA]	100	100	100	100	100	100	100	100	100	38	38	32	8	8	8	8	6	6
690V	[kA]	100	100	100	100	100	100	8	8	6	6	6	6	4	4	4	4	3	3

##### • MMS 63HI

Rated operational current $I_e$ [A]	[A]	10	13	17	22	26	32	40	50	63	65
AC-2, AC-3											
230/240V	[kW]	2.2/3	3	3.7/4	4	5.5	7.5	7.5	11	15	15
400/415V	[kW]	3.7/4	5.5	7.5	7.5	11	15	18.5	22	30	30
500V	[kW]	4/5.5	7.5	11	11	15	18.5	22	30	37	37
690V	[kW]	7.5	11	11	15	18.5	22	30	45	55	55
Back-up fuses gG, gL, only if $I_{cc} > I_{cu}$ (* = No back up fuse required)											
230/240V	[kA]	*	*	*	*	*	*	*	*	*	*
400/415V	[kA]	*	*	100	125	125	125	160	160	160	160
440/460V	[kA]	100	100	100	125	125	125	125	160	160	160
500V	[kA]	100	100	100	100	100	100	100	100	100	100
690V	[kA]	63	63	63	80	80	80	80	80	80	80
Ultimate short-circuit breaking capacity $I_{cu}$											
230/240V	[kA]	100	100	100	100	100	100	100	100	100	75
400/415V	[kA]	100	100	50	50	50	50	50	50	50	35
440/460V	[kA]	50	50	50	50	35	35	35	35	35	25
500V	[kA]	50	42	12	12	12	10	10	10	10	6
690V	[kA]	6	6	5	5	5	5	5	5	5	3
Rated service short-circuit breaking capacity $I_{cs}$											
230/240V	[kA]	100	100	100	100	100	100	100	100	100	50
400/415V	[kA]	100	100	50	50	50	50	50	50	50	27
440/460V	[kA]	38	38	38	38	27	27	27	27	27	19
500V	[kA]	38	32	9	9	9	8	8	8	8	5
690V	[kA]	5	5	5	5	5	5	5	5	5	3

##### • MMS 100HI

Rated operational current $I_e$ [A]	[A]	17	22	26	32	40	50	63	75	90	100
AC-2, AC-3											
230/240V	[kW]	3.7/4	4	5.5	7.5	7.5	11	15	22	30	30
400/415V	[kW]	7.5	7.5	11	15	18.5	22	30	37	45	45
500V	[kW]	11	11	15	18.5	22	30	37	45	55	63
690V	[kW]	11	15	18.5	22	30	45	55	63	75	90
Back-up fuses gG, gL, only if $I_{cc} > I_{cu}$ (* = No back up fuse required)											
230/240V	[kA]	*	*	*	*	*	*	*	*	*	*
400/415V	[kA]	*	*	*	*	*	*	*	*	*	*
440/460V	[kA]	125	125	125	160	160	200	200	200	200	200
500V	[kA]	100	125	125	125	160	160	160	160	160	160
690V	[kA]	80	80	80	80	80	100	100	125	160	160
Ultimate short-circuit breaking capacity $I_{cu}$											
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100
400/415V	[kA]	100	100	100	100	100	100	100	75	75	75
440/460V	[kA]	50	50	50	50	50	50	50	50	50	50
500V	[kA]	35	35	35	25	20	15	15	12	12	12
690V	[kA]	12	12	12	12	12	10	8	6	6	6
Rated service short-circuit breaking capacity $I_{cs}$											
230/240V	[kA]	100	100	100	100	100	100	100	100	100	100
400/415V	[kA]	100	50	50	50	50	50	50	50	50	50
440/460V	[kA]	38	38	38	38	38	38	38	38	38	38
500V	[kA]	27	27	27	19	15	11	11	9	9	9
690V	[kA]	9	9	9	9	9	8	6	6	6	6

# Manual motor controller (UL 508, CSA C22.2 as Manual motor controllers)

## Combination Motor Controller

- Group Installation
- Type E starter

### • MMS 32S

Rated operational current I <sub>e</sub> [A]		0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32	40	
<b>Max. short-circuit current</b>																			
240V	[kA]	100	100	100	100	100	100	100	100	100	100	50	50	40	30	30	20	20	
480V	[kA]	50	50	50	50	50	50	50	50	25	25	10	10	10	10	7.5	7.5	7.5	
600V	[kA]	10	10	10	10	10	10	10	5	5	5	5	5	5	5	5	5	5	
<b>Motor load</b>																			
1 Phase	115V [HP]	-	-	-	-	-	-	-	1/8	1/4	1/3	1/2	1/2	1	1½	2	2	3	
	230V [HP]	-	-	-	-	-	1/10	1/6	1/3	1/2	1	1½	2	3	3	5	7½		
3 Phase	200V [HP]	-	-	-	-	-	-	1/2	3/4	1	2	2	3	3	5	7½	7½	10	
	230V [HP]	-	-	-	-	-	-	1/2	3/4	1½	2	3	3	5	7½	7½	10	10	
	460V [HP]	-	-	-	-	-	3/4	1	2	3	5	5	7½	10	15	15	20	30	
	575V [HP]	-	-	-	-	1/2	3/4	1½	3	5	5	7½	10	15	20	20	30	30	
<b>Max. fuse size</b>		[A]	1	1	1	1	3	6	10	15	20	30	40	50	60	80	100	125	125
<b>Max. breaker size</b>		[A]	15	15	15	15	15	15	15	15	20	30	40	50	60	80	100	125	125

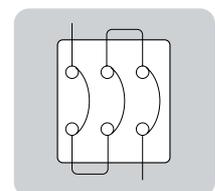
### • MMS 63S

Rated operational current I <sub>e</sub> [A]		10	13	17	22	26	32	40	50	63	65
<b>Max. short-circuit current</b>											
240V	[kA]	100	100	100	100	100	100	100	100	100	100
480V	[kA]	50	50	40	40	40	40	40	40	40	40
600V	[kA]	10	10	10	10	10	10	10	10	10	10
<b>Motor load</b>											
1 Phase	115V [HP]	1/2	1/2	1	1½	2	2	3	3	5	5
	230V [HP]	1½	2	3	3	3	5	7½	10	10	10
3 Phase	200V [HP]	2	3	3	5	7½	7½	10	15	20	20
	230V [HP]	3	3	5	7½	7½	10	10	15	20	20
	460V [HP]	5	7½	10	15	15	20	30	30	40	40
	575V [HP]	7½	10	15	20	20	30	30	40	60	60
<b>Maximum rated current of fuse or breaker</b>		[A]	600	600	600	600	600	600	600	600	600

### • MMS 100S

Rated operational current I <sub>e</sub> [A]		17	22	26	32	40	50	63	75	90	100
<b>Max. short-circuit current</b>											
240V	[kA]	100	100	100	100	100	100	100	100	100	100
480V	[kA]	50	50	50	50	50	50	40	40	40	40
600V	[kA]	10	10	10	10	10	10	10	10	10	10
<b>Motor load</b>											
1 Phase	115V [HP]	1	1½	2	2	3	3	5	5	7½	10
	230V [HP]	3	3	3	5	7½	10	10	15	20	20
3 Phase	200V [HP]	3	5	7½	7½	10	15	20	20	25	30
	230V [HP]	5	7½	7½	10	10	15	20	25	30	30
	460V [HP]	10	15	15	20	30	30	40	50	60	75
	575V [HP]	15	20	20	30	30	40	60	60	75	100
<b>Maximum rated current of fuse or breaker</b>		[A]	1000	1000	1000	1000	1000	1000	1000	1000	1000

In case of 1-phase use in series as shown below



# Manual Motor Starters

## Technical Information

### Manual motor controller (UL 508, CSA C22.2 as Manual motor controllers)

Combination Motor Controller

- Group Installation

- Type E starter

#### ● MMS 32H

Rated operational current I <sub>e</sub> [A]			0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32	40	
<b>Max. short-circuit current</b>																				
240V	[kA]		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
480V	[kA]		65	65	65	65	65	65	65	65	65	65	65	65	30	30	30	30	30	30
600V	[kA]		25	25	25	25	25	25	25	25	25	25	25	25	10	10	10	10	10	10
<b>Motor load</b>																				
1 Phase	115V	[HP]	-	-	-	-	-	-	-	1/8	1/4	1/3	1/2	1/2	1	1½	2	2	3	
	230V	[HP]	-	-	-	-	-	1/10	1/6	1/3	1/2	1	1½	2	3	3	3	5	7½	
3 Phase	200V	[HP]	-	-	-	-	-	-	1/2	3/4	1	2	2	3	3	5	7½	7½	10	
	230V	[HP]	-	-	-	-	-	-	1/2	3/4	1½	2	3	3	5	7½	7½	10	10	
	460V	[HP]	-	-	-	-	-	3/4	1	2	3	5	5	7½	10	15	15	20	30	
	575V	[HP]	-	-	-	-	1/2	3/4	1½	3	5	5	7½	10	15	20	20	30	30	
<b>Maximum rated current of fuse or breaker</b>			[A]	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500

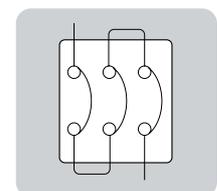
#### ● MMS 63H

Rated operational current I <sub>e</sub> [A]			10	13	17	22	26	32	40	50	63	65
<b>Max. short-circuit current</b>												
240V	[kA]		100	100	100	100	100	100	100	100	100	100
480V	[kA]		65	65	50	50	50	50	50	50	50	50
600V	[kA]		25	25	10	10	10	10	10	10	10	10
<b>Motor load</b>												
1 Phase	115V	[HP]	1/2	1/2	1	1½	2	2	3	3	5	5
	230V	[HP]	1½	2	3	3	3	5	7½	10	10	10
3 Phase	200V	[HP]	2	3	3	5	7½	7½	10	15	20	20
	230V	[HP]	3	3	5	7½	7½	10	10	15	20	20
	460V	[HP]	5	7½	10	15	15	20	30	30	40	40
	575V	[HP]	7½	10	15	20	20	30	30	40	60	60
<b>Maximum rated current of fuse or breaker</b>			[A]	600	600	600	600	600	600	600	600	600

#### ● MMS 100H

Rated operational current I <sub>e</sub> [A]			17	22	26	32	40	50	63	75	90	100
<b>Max. short-circuit current</b>												
240V	[kA]		100	100	100	100	100	100	100	100	100	100
480V	[kA]		65	65	65	65	65	65	50	50	50	50
600V	[kA]		25	25	25	20	20	20	10	10	10	10
<b>Motor load</b>												
1 Phase	115V	[HP]	1	1½	2	2	3	3	5	5	7½	10
	230V	[HP]	3	3	3	5	7½	10	10	15	20	20
3 Phase	200V	[HP]	3	5	7½	7½	10	15	20	20	25	30
	230V	[HP]	5	7½	7½	10	10	15	20	25	30	30
	460V	[HP]	10	15	15	20	30	30	40	50	60	75
	575V	[HP]	15	20	20	30	30	40	60	60	75	100
<b>Maximum rated current of fuse or breaker</b>			[A]	1000	1000	1000	1000	1000	1000	1000	1000	1000

In case of 1-phase use in series as shown below



# Manual Motor Controller (UL508)

## • MMS 32S

Rated operational current I <sub>e</sub> [A]		0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32	40	
<b>Max. short-circuit current</b>																			
240V	[kA]	100	100	100	100	100	100	100	100	100	100	50	50	40	30	30	20	20	
480V	[kA]	50	50	50	50	50	50	50	50	25	25	10	10	10	10	7.5	7.5	7.5	
600V	[kA]	10	10	10	10	10	10	10	5	5	5	5	5	5	5	5	5	5	
<b>Motor load</b>																			
1 Phase	115V [HP]	-	-	-	-	-	-	-	1/8	1/4	1/3	1/2	1/2	1	1½	2	2	3	
	230V [HP]	-	-	-	-	-	1/10	1/6	1/3	1/2	1	1½	2	3	3	3	5	7½	
3 Phase	200V [HP]	-	-	-	-	-	-	1/2	3/4	1	2	2	3	3	5	7½	7½	10	
	230V [HP]	-	-	-	-	-	-	1/2	3/4	1½	2	3	3	5	7½	7½	10	10	
	460V [HP]	-	-	-	-	-	3/4	1	2	3	5	5	7½	10	15	15	20	30	
	575V [HP]	-	-	-	-	-	1/2	3/4	1½	3	5	5	7½	10	15	20	20	30	
<b>Max. fuse size</b>		[A]	1	1	1	1	3	6	10	15	20	30	40	50	60	80	100	125	150
<b>Max. breaker size</b>		[A]	15	15	15	15	15	15	15	15	20	30	40	50	60	80	100	125	150

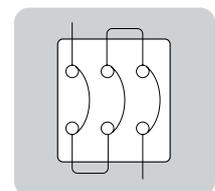
## • MMS 63S

Rated operational current I <sub>e</sub> [A]		10	13	17	22	26	32	40	50	63	65	
<b>Max. short-circuit current</b>												
240V	[kA]	100	100	100	100	100	100	100	100	100	100	
480V	[kA]	25	25	25	25	25	25	25	25	25	25	
600V	[kA]	10	10	10	10	10	10	10	10	10	10	
<b>Motor load</b>												
1 Phase	115V [HP]	1/2	1/2	1	1½	2	2	3	3	5	5	
	230V [HP]	1½	2	3	3	3	5	7½	10	10	10	
3 Phase	200V [HP]	2	3	3	5	7½	7½	10	15	20	20	
	230V [HP]	3	3	5	7½	7½	10	10	15	20	20	
	460V [HP]	5	7½	10	15	15	20	30	30	40	40	
	575V [HP]	7½	10	15	20	20	30	30	40	60	60	
<b>Max. fuse size</b>		[A]	40	50	60	80	100	125	150	200	250	250
<b>Max. breaker size</b>		[A]	40	50	60	80	100	125	150	200	250	250

## • MMS 100S

Rated operational current I <sub>e</sub> [A]		17	22	26	32	40	50	63	75	90	100	
<b>Max. short-circuit current</b>												
240V	[kA]	100	100	100	100	100	100	100	100	100	100	
480V	[kA]	25	25	25	25	25	25	25	25	25	25	
600V	[kA]	10	10	10	10	10	10	10	10	10	10	
<b>Motor load</b>												
1 Phase	115V [HP]	1	1½	2	2	3	3	5	5	7½	10	
	230V [HP]	3	3	3	5	7½	10	10	15	20	20	
3 Phase	200V [HP]	3	5	7½	7½	10	15	20	20	25	30	
3 Phase	230V [HP]	5	7½	7½	10	10	15	20	25	30	30	
	460V [HP]	10	15	15	20	30	30	40	50	60	75	
	575V [HP]	15	20	20	30	30	40	60	60	75	100	
<b>Max. fuse size</b>		[A]	60	80	100	125	150	200	250	300	350	400
<b>Max. breaker size</b>		[A]	60	80	100	125	150	200	250	300	350	400

In case of 1-phase use in series as shown below



# Manual Motor Starters

## Technical Information

### Manual Motor Controller (UL508)

#### ● MMS 32H

Rated operational current I <sub>e</sub> [A]		0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	32	40	
<b>Max. short-circuit current</b>																			
240V	[kA]	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
480V	[kA]	50	50	50	50	50	50	50	50	50	50	50	50	30	30	30	30	30	
600V	[kA]	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
<b>Motor load</b>																			
1 Phase	115V [HP]	-	-	-	-	-	-	-	1/8	1/4	1/3	1/2	1/2	1	1½	2	2	3	
	230V [HP]	-	-	-	-	-	1/10	1/6	1/3	1/2	1	1½	2	3	3	3	5	7½	
3 Phase	200V [HP]	-	-	-	-	-	-	1/2	3/4	1	2	2	3	3	5	7½	7½	10	
	230V [HP]	-	-	-	-	-	-	1/2	3/4	1½	2	3	3	5	7½	7½	10	10	
	460V [HP]	-	-	-	-	-	3/4	1	2	3	5	5	7½	10	15	15	20	30	
	575V [HP]	-	-	-	-	1/2	3/4	1½	3	5	5	7½	10	15	20	20	30	30	
<b>Max. fuse size</b>	[A]	1	1	1	1	3	6	10	15	20	30	40	50	60	80	100	125	150	
<b>Max. breaker size</b>	[A]	15	15	15	15	15	15	15	15	20	30	40	50	60	80	100	125	150	

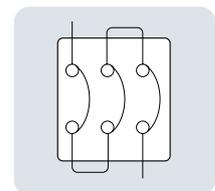
#### ● MMS 63H

Rated operational current I <sub>e</sub> [A]		10	13	17	22	26	32	40	50	63	65	
<b>Max. short-circuit current</b>												
240V	[kA]	100	100	100	100	100	100	100	100	100	100	
480V	[kA]	50	50	50	50	50	50	50	50	50	50	
600V	[kA]	10	10	10	10	10	10	10	10	10	10	
<b>Motor load</b>												
1 Phase	115V [HP]	1/2	1/2	1	1½	2	2	3	3	5	5	
	230V [HP]	1½	2	3	3	3	5	7½	10	10	10	
3 Phase	200V [HP]	2	3	3	5	7½	7½	10	15	20	20	
	230V [HP]	3	3	5	7½	7½	10	10	15	20	20	
	460V [HP]	5	7½	10	15	15	20	30	30	40	40	
	575V [HP]	7½	10	15	20	20	30	30	40	60	60	
<b>Max. fuse size</b>	[A]	40	50	60	80	100	125	150	200	250	250	
<b>Max. breaker size</b>	[A]	40	50	60	80	100	125	150	200	250	250	

#### ● MMS 100H

Rated operational current I <sub>e</sub> [A]		17	22	26	32	40	50	63	75	90	100
<b>Max. short-circuit current</b>											
240V	[kA]	100	100	100	100	100	100	100	100	100	100
480V	[kA]	50	50	50	50	50	50	50	50	50	50
600V	[kA]	10	10	10	10	10	10	10	10	10	10
<b>Motor load</b>											
1 Phase	115V [HP]	1	1½	2	2	3	3	5	5	7½	10
	230V [HP]	3	3	3	5	7½	10	10	15	20	20
3 Phase	200V [HP]	3	5	7½	7½	10	15	20	20	25	30
	230V [HP]	5	7½	7½	10	10	15	20	25	30	30
	460V [HP]	10	15	15	20	30	30	40	50	60	75
	575V [HP]	15	20	20	30	30	40	60	60	75	100
<b>Max. fuse size</b>	[A]	60	80	100	125	150	200	250	300	350	400
<b>Max. breaker size</b>	[A]	60	80	100	125	150	200	250	300	350	400

In case of 1-phase use in series as shown below



## Type '2' coordination according to IEC 947-4-1

- Short-circuit current  $I_q = 50\text{kA}$   
Voltage : 400/415V, 50/60Hz

Standard motors AC-3 at 400/415V 1500rpm		Manual motor starter			Contactor	
[kW]	[A]	Circuit breaker Type	Thermal overload release setting range [A]	Magnetic release response current [A]	Type	[A]
-	-	MMS-32S 0.16A	0.1~0.16	2.08	GMC-6M / GMC-9	6 / 9
0.06	0.2	MMS-32S 0.25A	0.16~0.25	3.25	GMC-6M / GMC-9	6 / 9
0.09	0.3	MMS-32S 0.4A	0.25~0.4	5.2	GMC-6M / GMC-9	6 / 9
0.12	0.4	MMS-32S 0.63A	0.4~0.63	8.19	GMC-6M / GMC-9	6 / 9
0.18	0.6	MMS-32S 0.63A	0.4~0.63	8.19	GMC-6M / GMC-9	6 / 9
0.25	0.8	MMS-32S 1A	0.63~1	13	GMC-6M / GMC-9	6 / 9
0.37	1.1	MMS-32S 1.6A	1~1.6	20.8	GMC-6M / GMC-9	6 / 9
0.55	1.5	MMS-32S 1.6A	1~1.6	20.8	GMC-6M / GMC-9	6 / 9
0.75	1.9	MMS-32S 2.5A	1.6~2.5	32.5	GMC-12	12
1.1	2.7	MMS-32S 4A	2.5~4	52	GMC-18	18
1.5	3.6	MMS-32S 4A	2.5~4	52	GMC-18	18
2.2	5.2	MMS-32S 6A	4~6	78	GMC-18	18
3	6.8	MMS-32S 8A	5~8	104	GMC-18	18
4	9	MMS-32S 10A	6~10	130	GMC-18	18
5.5	11.5	MMS-32H 13A	9~13	169	GMC-22	22
7.5	15.5	MMS-32H 17A	11~17	221	GMC-22	22
10	20	MMS-32H 22A	14~22	286	GMC-32	32
11	22	MMS-32H 26A	18~26	338	GMC-32	32
15	29	MMS-32H 32A	22~32	416	GMC-32	32
18.5	35	MMS-63H 40A	28~40	520	GMC-50	50
22	41	MMS-63H 50A	34~50	650	GMC-50	50
30	55	MMS-63H 63A	45~63	819	GMC-65	65
37	67	MMS-100S 75A	55~75	975	GMC-75	75
45	80	MMS-100S 100A	80~100	1300	GMC-85	85

### Definition type '2' coordination according to IEC 947-4-1 :

- The contactor or the starter must not endanger persons or systems in the event of a short-circuit.
- The contactor or the starter must be suitable for further use.
- No damage to the overload relay or other parts may occur with the exception of welding of the contactor or starter contacts provided that these can be easily separated without significant deformation (such as with a screwdriver).

# Manual Motor Starters

## Technical Information

### IE3-rated motor

#### • LS MMS ready for IE3-rated motors

Type	Rated Current(A)	Short-circuit Current(A)	Current Range(A)			Short-circuit Current ratio		
			Min	Mid	Max	Min	Mid	Max
<b>32</b>	0.16A	2.1	0.1	0.13	0.16	20.8	16.0	13.0
	0.25A	3.3	0.16	0.2	0.25	20.3	16.3	13.0
	0.4A	5.2	0.25	0.33	0.4	20.8	15.8	13.0
	0.63A	8.2	0.4	0.52	0.63	20.5	15.8	13.0
	1A	13.0	0.63	0.81	1	20.6	16.0	13.0
	1.6A	20.8	1	1.3	1.6	20.8	16.0	13.0
	2.5A	32.5	1.6	2.1	2.5	20.3	15.5	13.0
	4A	52	2.5	3.3	4	20.8	15.8	13.0
	6A	78	4	5	6	19.5	15.6	13.0
	8A	104	5	6.5	8	20.8	16.0	13.0
	10A	130	6	8	10	21.7	16.3	13.0
	13A	169	9	11	13	18.8	15.4	13.0
	17A	221	11	14	17	20.1	15.8	13.0
	22A	286	14	18	22	20.4	15.9	13.0
	26A	338	18	22	26	18.8	15.4	13.0
32A	416	22	27	32	18.9	15.4	13.0	
40A	520	28	34	40	18.6	15.3	13.0	
<b>63</b>	10A	130	6	8	10	21.7	16.3	13.0
	13A	169	9	11	13	18.8	15.4	13.0
	17A	221	11	14	17	20.1	15.8	13.0
	22A	286	14	17	22	20.4	16.8	13.0
	26A	338	18	22	26	18.8	15.4	13.0
	32A	416	22	27	32	18.9	15.4	13.0
	40A	520	28	34	40	18.6	15.3	13.0
	50A	650	34	42	50	19.1	15.5	13.0
	63A	819	45	54	63	18.2	15.2	13.0
65A	845	47	56	65	18.0	15.1	13.0	
<b>100</b>	17A	221	11	14	17	20.1	15.8	13.0
	22A	286	14	18	22	20.4	15.9	13.0
	26A	338	18	22	26	18.8	15.4	13.0
	32A	416	22	27	32	18.9	15.4	13.0
	40A	520	28	34	40	18.6	15.3	13.0
	50A	650	34	42	50	19.1	15.5	13.0
	63A	819	45	54	63	18.2	15.2	13.0
	75A	975	55	65	75	17.7	15.0	13.0
	90A	1170	70	80	90	16.7	14.6	13.0
	100A	1300	80	90	100	16.3	14.4	13.0



### • What is the IE3?

Motor is rated from IE1 through IE4 depends on its energy efficiency which means IE3 is more efficient compared to IE1 and IE2-rated motors.

### • Why IE3?

As part of the EU Environmental policy "20/30-20-20" strategy, the EU is committed to achieve the followings by 2020.

- Reduce greenhouse gas emissions by up to 30 %
- Increase the share of renewable energy to 20 % and
- Boost energy efficiency by 20% in general.

IEC 60034-30 standard specifies IE classes for motors in accordance with the above requirements.

Therefore, consumers must comply with the standard when using MMS products.

- IEC 60034-30-1 standard
- IE1 Standard Efficiency
- IE2 High Efficiency
- **IE3 Premium Efficiency**
- IE4 Super Premium Efficiency

### • How to select MMS?

To meet the IE3 motor starting current & Inrush current, use of de-rating table is recommended. (13 times the rated current)

#### Example)

If you select the product A or B...  
 A : MMS setting scale " 11 ~ 17A  
 B : MMS setting scale " 14 ~ 22A  
 Rated motor Current : 16A

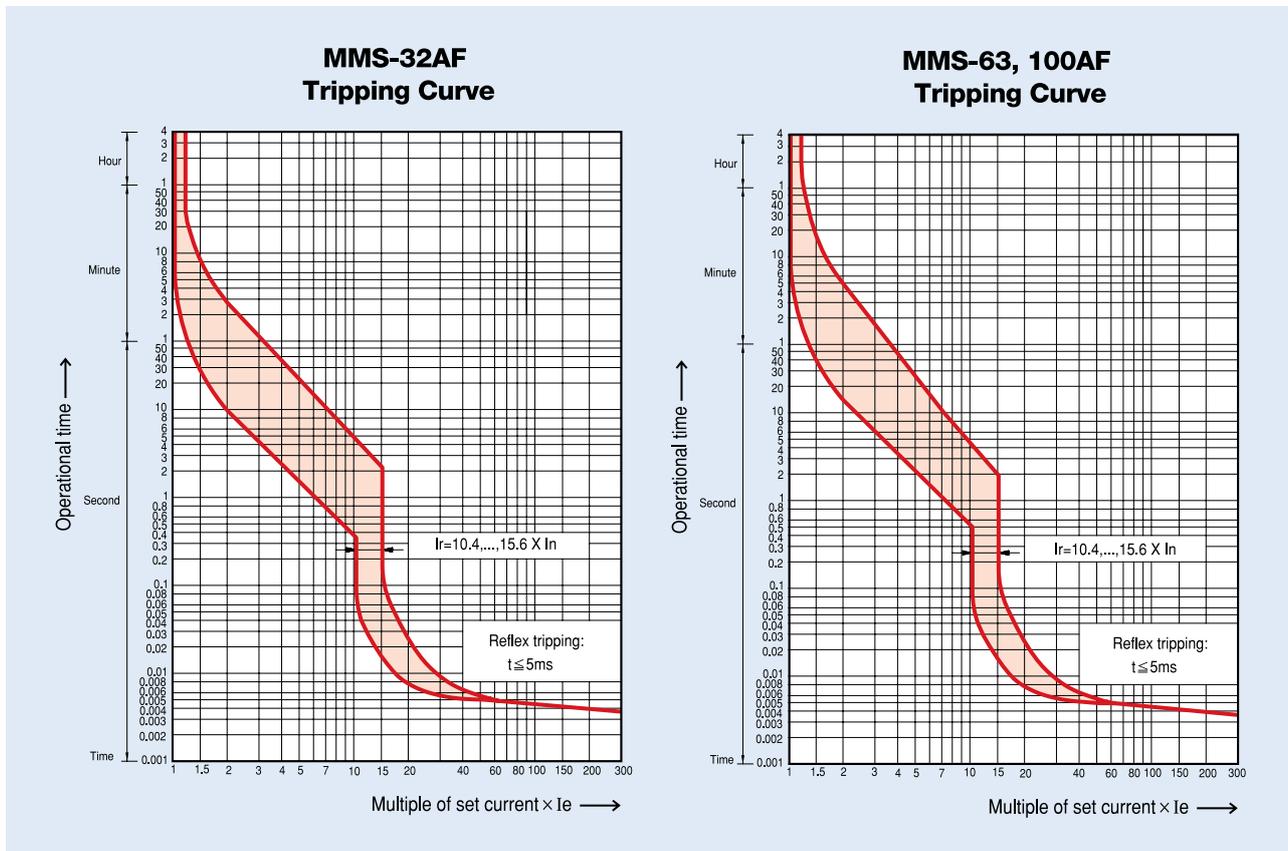
The short-circuit current of MMS A is 221A (17\*13), and MMS B is 286A (22\*13).  
 When applying the motor's rated current(16A) to MMS A, the multiplier of the short-circuit current is 13.8 times. When applying the motor's rated current(16A) to MMS B, the multiplier of the short-circuit current is 17.9 times. If motor of IE3-grade or above is used here, malfunction can be caused due to higher starting current compared to that of IE1,2-graded motor. Therefore, MMS B is recommended since it has the higher multiplier of the short-circuit current.



# Manual Motor Starters

## Technical Information

### Thermal limit on short circuit for MMS



#### I ) Thermal release trip current :

The adjustable inverse bimetal trip reliability protects motors against overloads.

The curve shows the mean operating current at an ambient temperature of 20°C starting from cold.

Careful testing and setting ensures effective motor protection even in the case of single-phasing.

#### II ) Magnetic release trip current :

The instantaneous magnetic trip has a fixed operating current setting.

This corresponds to 13 times the maximum value of setting range,

at a lower setting it is correspondingly higher.

#### Current setting $I_e$ :

The overload trip corresponds to a thermal overload relay in a motor starter conforming to IEC 947-4-1.

If a different value is prescribed (e.g. reduced  $I_e$  for cooling medium having a temperature higher

than 40°C or a place of installation higher than 2000m above sea level),

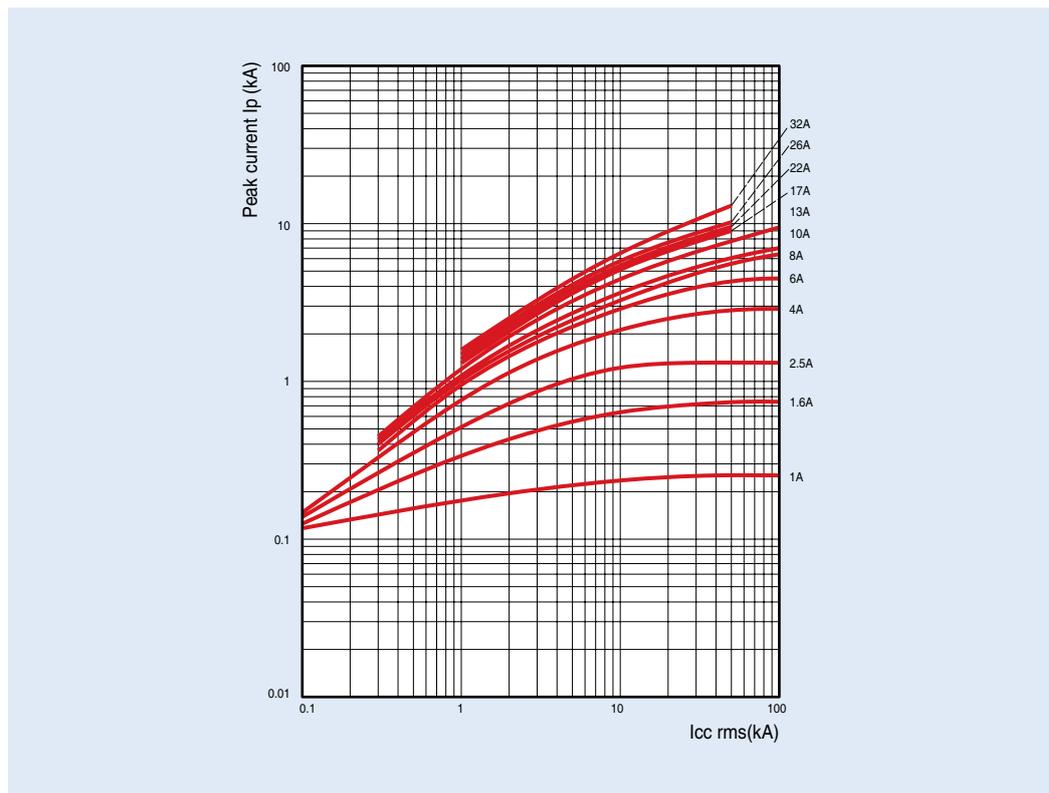
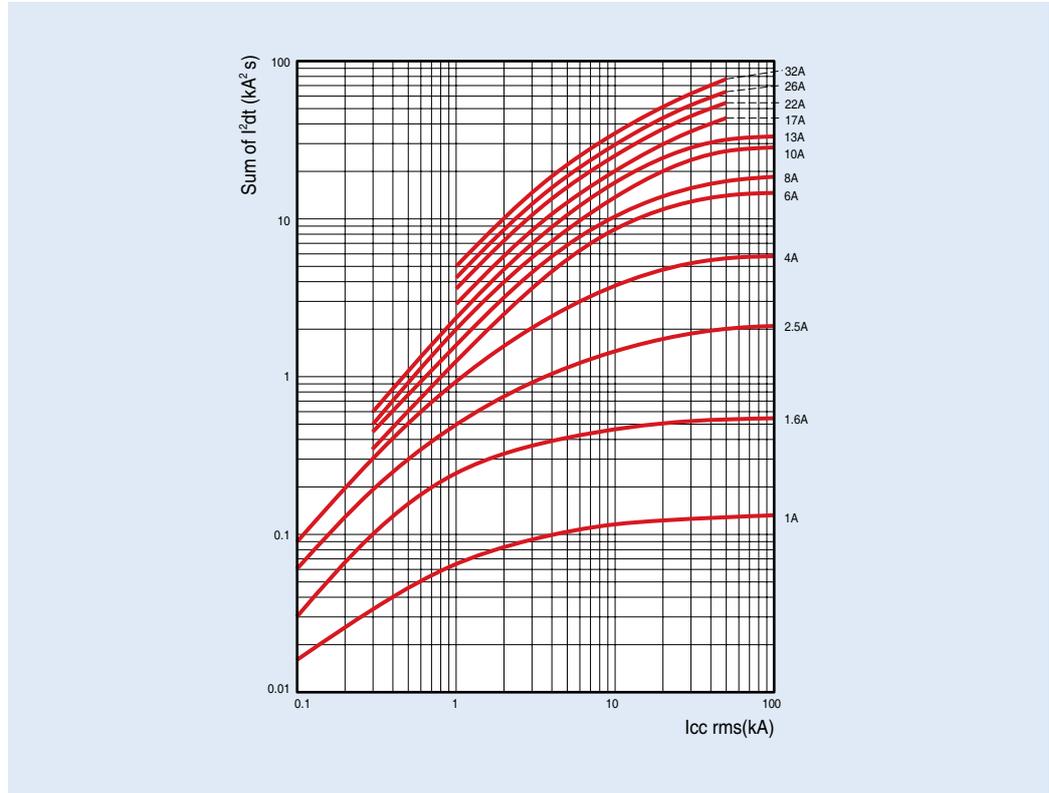
the setting current is equal to the reduced rated current  $I_e$  of the motor.

# Technical Information

## Thermal limit on short circuit for MMS

Thermal limit in  $\text{kA}^2\text{s}$  in the magnetic operating zone ( $U_e=415\text{V}$ )

- MMS-32S/H/Hi



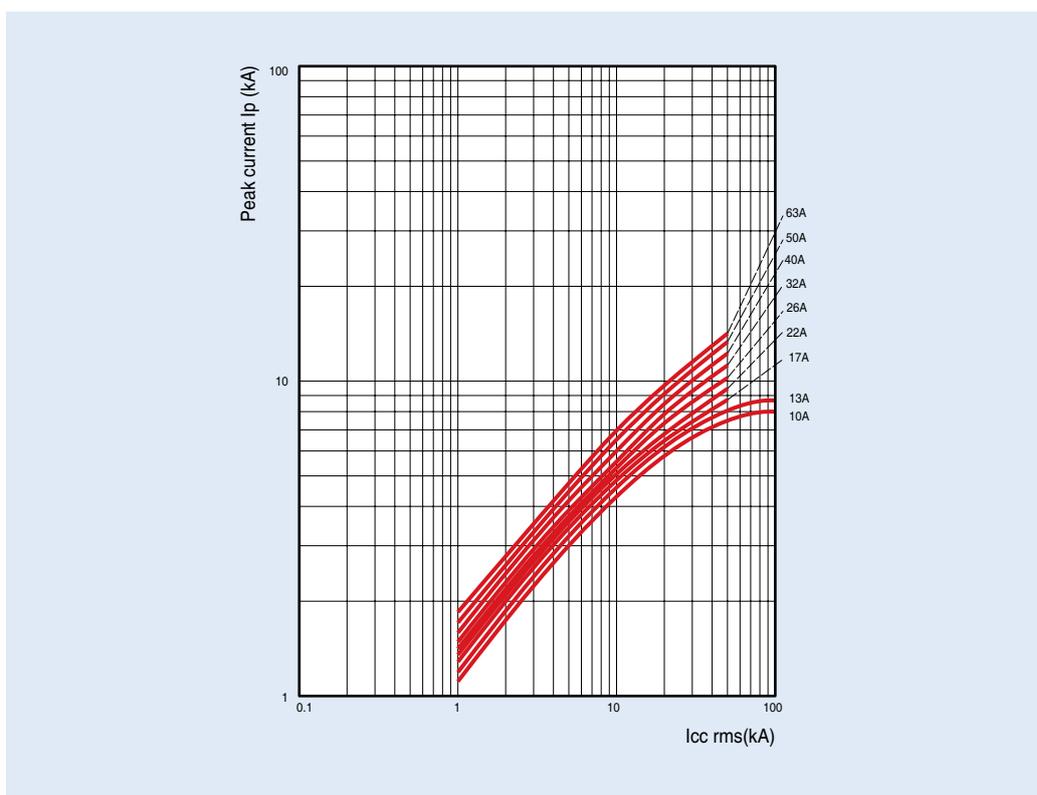
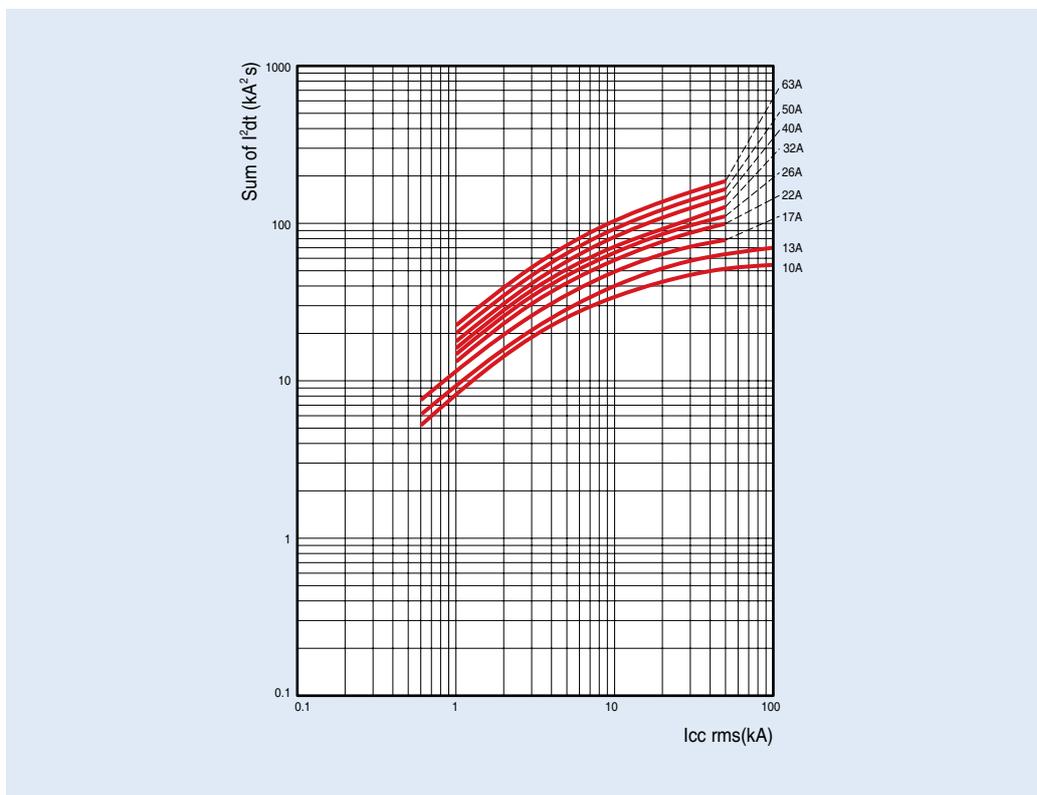
# Manual Motor Starters

## Technical Information

### Thermal limit on short circuit for MMS

Thermal limit in  $\text{kA}^2\text{s}$  in the magnetic operating zone ( $U_e=415\text{V}$ )

- MMS-63S/H/HI



### Thermal limit in $kA^2s$ in the magnetic operating zone ( $U_e=415V$ )

- MMS-100S/H/Hi

