Series KT7 Motor Circuit Controllers

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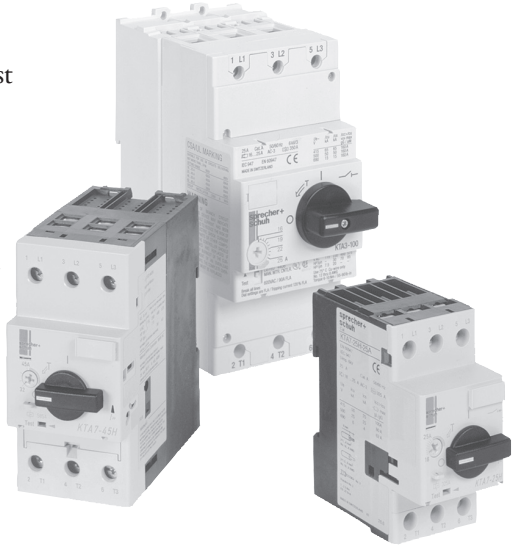
Sprecher+Schuh's KT7 series of Motor Circuit Controllers are some of the most versatile and technologically advanced control products available today.

In one small package, KT7s combine the functions of:

- Current limiting short circuit protection
- Class 10 thermal overload protection
- Switching and
- Signaling

These devices can be used in a wide variety of control schemes that reduce panel space, simplify installation and eliminate the need for more expensive equipment.



Versatile, convenient and space saving… for a variety of applications

Increased ratings…

Sprecher+Schuh's KT7 controller family offers higher interrupting capacities (KAIC ratings) and improved Type 2 Coordination and Type E (life after short-circuit). The KTA7-25H/32H offers the option of higher short-circuit current ratings (SCCR) than the standard interrupting capacity of the KTA7-25S/32S Motor Controllers. KTA7 is also available in frames up to 45A. KTC7 can be used with High Efficiency motors. KTB7 Magnetic Only controllers can be combined with CA7 contactors and CEP7 overloads to provide additional features. KTV7 series motor controllers are suitable for application at the output of variable frequency drive (VFD) in multi-motor installations.

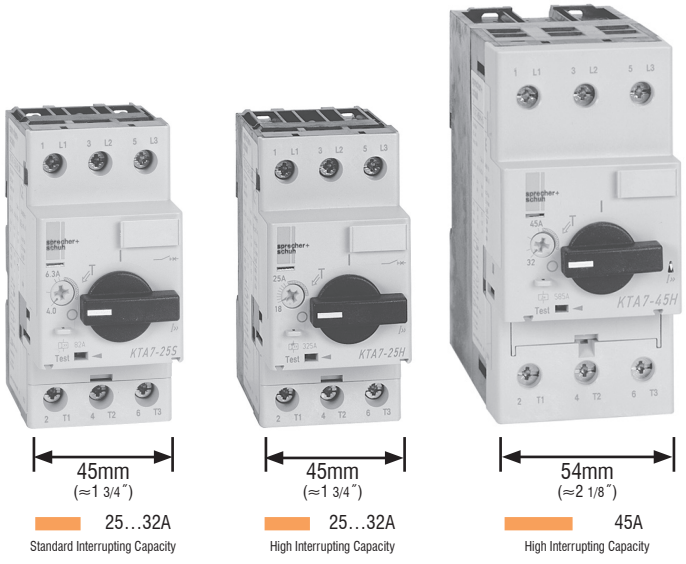
Designed for multiple applications

UL rules allow KT7 Motor Circuit Controllers to be used in a wide variety of applications including:

- Manual Starter Applications
- Traditional Group Motor Applications with compliance to the Tap Conductor Ratings
- Motor Disconnect Applications
- Self-Protected Manual Combination Starter Applications (Type E)
- Individual Combination Starter Applications (Type E/F)
- Multi-motor Starter Combination Applications (Type E/F)

See our online white paper

Methods of Applying KT7 Motor Circuit Controllers



Construction Type E Listing

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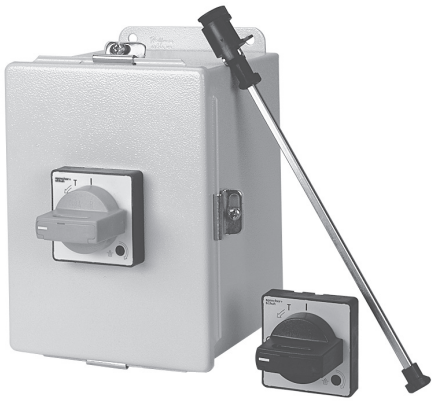
Advanced current limiting and breaking capacity has allowed KT7s to be UL / CSA listed as self-protected (Construction Type E) manual combination motor controllers. This eliminates the need for an upstream fuse or circuit breaker when using the KT7 as a manual motor starter. In addition, KT7s *also* meet UL requirements for "at-motor disconnects," which means they can be used in an enclosure with a lockable handle as a manual motor starter for individual circuits, and are also an approved means of motor disconnect.



KT7s meet UL requirements for Type E manual motor controllers and "at-motor disconnects"

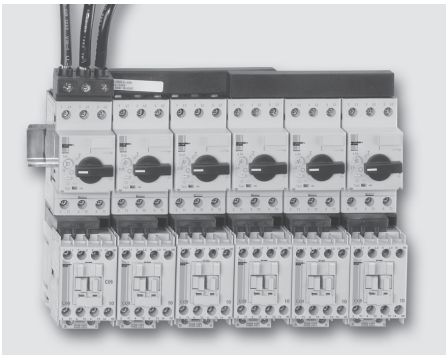
Type E + Combo starter + Economy = "Ecombo" starter

When the KT7 self-protected manual combination starter is combined with Sprecher + Schuh's CA7 contactor to provide remote operation, we now have an alternative to the classic combination starter. We call these "Ecombo" starters, which save significant dollars and panel space over conventional combo starters. Ecombo starters are available for applications up to 45 Amperes (30 HP @ 460V).

See a complete explanation of Ecombo starters beginning on page F58 of this catalog.

Multi-motor applications… Popular and money saving

Because of the KT7's Construction Type E – UL Rating as a self-protected combination starter, many group motor installations can utilize an even simpler design and less expensive equipment. The result is minimum panel size and maximum flexibility while avoiding cumbersome NEC group motor installation rules.

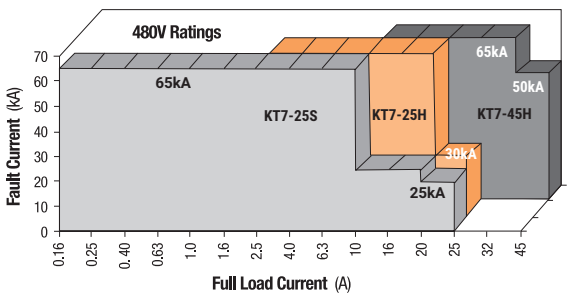


Using KT7s in Multi-Motor Starter applications can replace classic Branch Circuit Protection Devices and reduce panel space up to 60%

Excellent short circuit protection characteristics

In the event of a short-circuit, the contacts are opened by magnetic, non-adjusting tripping elements in times approaching 2/1000 of a second. This results in the extremely rapid buildup of an arc voltage which limits the current of the short-circuit to a very low level. Because of this superb current limiting capability, KTA Motor Circuit Controllers have a short circuit capacity of up to 65kA at 480Y/277V and up to 47kA at 600Y/347V (see illustration below).

Manual Motor Starter Ratings



Superb thermal overload protection

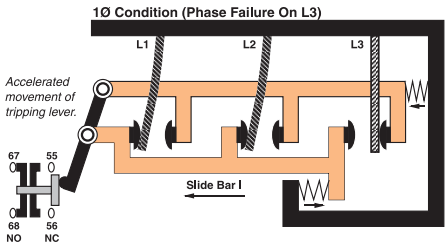
Every KT7 device is individually calibrated at the factory for the smallest and largest current it can handle. When coupled with automatic ambient temperature compensation over a range of -25°C to +60°C, very accurate thermal overload protection is obtained. In addition, the KT7 is a Class 10 device… it trips within 10 seconds under locked rotor conditions (6 x FLA). This better protects today's T-Frame motors.

Special units for special applications

KTC7 controllers are available with a fixed magnetic trip set at 16…20x the maximum value of the current adjustment range (as opposed to 13x for the KTA7). This prevents nuisance tripping in applications utilizing high efficiency motors for example. The KTB7 Magnetic Only model is available *without* the thermal trip feature for special applications where a separate motor overload is required.

Other protection features

All KT7 Motor Circuit Controllers provide accelerated tripping under single phase conditions. This is accomplished with a special "differential tripping" mechanism built into each device.



All KT7 Motor Circuit Controllers offer accelerated tripping under single phase conditions

KTA7 Base Unit

Maximum Horsepower						Current Adjustment Range [A]	Magnetic Release Response Current [A]	Catalog Number
Typical Single Phase		Typical Three Phase [HP]						
115V	230V	200V	230V	460V	575V			
KTA7-25…32S — Standard Interrupting Capacity								
~	~	~	~	~	~	0.10...0.16	2.1	**KTA7-25S-0.16A**
~	~	~	~	~	~	0.16...0.25	3.3	**KTA7-25S-0.25A**
~	~	~	~	~	1/4	0.25...0.40	5.2	**KTA7-25S-0.4A**
~	~	~	~	1/4	1/3	0.40...0.63	8.2	**KTA7-25S-0.63A**
~	~	~	~	1/2	3/4	0.63...1.0	13	**KTA7-25S-1A**
~	1/10	1/4	1/3	1	1	1.0...1.6	21	**KTA7-25S-1.6A**
1/10	1/6	1/2	3/4	1-1/2	2	1.6...2.5	33	**KTA7-25S-2.5A**
1/8	1/3	1	1	3	3	2.5...4	52	**KTA7-25S-4A**
1/4	3/4	1-1/2	2	5	5	4...6.3	82	**KTA7-25S-6.3A**
1/2	1-1/2	3	3	7-1/2	10	6.3...10	130	**KTA7-25S-10A**
1	3	5	5	10	15	10...16	208	**KTA7-25S-16A**
1-1/2	3	5	7-1/2	15	20	14.5...20	260	**KTA7-25S-20A**
2	3	7-1/2	7-1/2	20	20	18...25	325	**KTA7-25S-25A**
2	5	7-1/2	10	20	25	24...29	406	**KTA7-32S-29A**
3	5	7-1/2	10	25	30	27...32	448	**KTA7-32S-32A**
KTA7-25…32H — High Interrupting Capacity								
1/10	1/6	1/2	3/4	1-1/2	2	1.6...2.5	33	**KTA7-25H-2.5A**
1/8	1/3	1	1	3	3	2.5...4	52	**KTA7-25H-4A**
1/4	1/2	1-1/2	2	5	5	4...6.3	82	**KTA7-25H-6.3A**
1/2	1-1/2	3	3	7-1/2	10	6.3...10	130	**KTA7-25H-10A**
1	3	5	5	10	15	10...16	208	**KTA7-25H-16A**
1-1/2	3	5	7-1/2	15	20	14.5...20	260	**KTA7-25H-20A**
2	3	7-1/2	7-1/2	20	20	18...25	325	**KTA7-25H-25A**
2	5	7-1/2	10	20	25	24...29	406	**KTA7-32H-29A**
3	5	7-1/2	10	25	30	27...32	448	**KTA7-32H-32A**
KTA7-45H — High Interrupting Capacity								
1/2	1-1/2	3	3	7-1/2	7-1/2	6.3...10	130	**KTA7-45H-10A**
1	3	5	5	10	10	10...16	208	**KTA7-45H-16A**
1-1/2	3	5	7-1/2	15	15	14.5...20	260	**KTA7-45H-20A**
2	3	7-1/2	10	20	20	18...25	325	**KTA7-45H-25A**
3	5	7-1/2	10	25	30	23...32	416	**KTA7-45H-32A**
3	7-1/2	10	15	30	40	32...45	585	**KTA7-45H-45A**

Catalog Number KTA7-25S

Catalog Number KTA7-25H

Catalog Number KTA7-45H

Horsepower ratings shown in the table are for reference only.
The final selection of the controller depends on the actual motor full load current and service factor.

- *For motor with service factor less than 1.15.* Use motor nameplate full load current times 0.9 and choose the motor starter with the appropriate current range. Example: Motor F.L.C. = 4.2A; S.F. = 1.0. – 4.2A x 0.9 = 3.78A. Select Catalog Number KTA7-25S-4A.

KTA7 UL Ratings Application Chart

Device	Manual Motor Starter		Manual Controller for Group Installation ❶			Manual Controller as Motor Disconnect ❷❺		Suitable for Tap Conductor Protection		Self-Protected Type E Manual Combination Controller ❸❹❺	
	Max. Short Circuit Current [kA]		Max. Fuse or Circuit Breaker	Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]	
	480V	600V		480V	600V	480V	600V	480Y/277V	600Y/347V	480Y/277V	600Y/347V
KTA7-25…32S — Standard Interrupting Capacity											
KTA7-25S-0.16A	65	47	450	65	47	65	47	65	47	65	47
KTA7-25S-0.25A	65	47	450	65	47	65	47	65	47	65	47
KTA7-25S-0.4A	65	47	450	65	47	65	47	65	47	65	47
KTA7-25S-0.63A	65	47	450	65	47	65	47	65	47	65	47
KTA7-25S-1A	65	47	450	65	47	65	47	65	47	65	47
KTA7-25S-1.6A	65	47	450	65	47	65	47	65	47	65	47
KTA7-25S-2.5A	65	30	450	65	30	65	30	65	30	65	30
KTA7-25S-4A	65	25	450	65	25	65	25	65	25	65	25
KTA7-25S-6.3A	65	30	450	65	30	65	30	65	~	65	~
KTA7-25S-10A	65	30	450	65	30	65	30	65	~	65	~
KTA7-25S-16A	30	30	450	30	30	30	30	30	~	30	~
KTA7-25S-20A	30	30	450	30	30	10	10	10	~	10	~
KTA7-25S-25A	25	10	450	25	10	10	5	~	~	~	~
KTA7-32S-29A	25	30	450	25	30	10	~	~	~	~	~
KTA7-32S-32A	25	30	450	25	30	10	~	~	~	~	~
KTA7-25…32H — High Interrupting Capacity											
KTA7-25H-2.5A	65	30	450	65	30	65	30	65	30	65	30
KTA7-25H-4A	65	30	450	65	30	65	30	65	30	65	30
KTA7-25H-6.3A	65	30	450	65	30	65	30	65	30	65	30
KTA7-25H-10A	65	30	450	65	30	65	30	65	30	65	30
KTA7-25H-16A	65	30	450	65	30	65	30	65	30	65	30
KTA7-25H-20A	65	30	450	65	30	65	30	65	~	65	~
KTA7-25H-25A	30	30	450	30	30	30	30	30	~	30	~
KTA7-32H-29A	30	30	450	30	30	30	18	~	~	~	~
KTA7-32H-32A	30	30	450	30	30	30	18	~	~	~	~
KTA7-45H — High Interrupting Capacity											
KTA7-45H-10A	65	30	600	65	30	65	30	65	30	65	30
KTA7-45H-16A	65	30	600	65	30	65	30	65	30	65	30
KTA7-45H-20A	65	30	600	65	30	65	30	65	30	65	30
KTA7-45H-25A	65	30	600	65	30	65	30	65	30	65	30
KTA7-45H-32A	65	30	600	65	30	65	30	65	30	65	30
KTA7-45H-45A	65	18	600	65	18	65	18	65	~	65	~

❶ UL 508, CSA 22.2 No. 14 for group installation, in connection with short-circuit protection device.
❷ UL 508 Part III.
❸ UL 508 Part IV.
❹ Type E applications require use of the KT7-xx-TE terminal adaptor on KT7s. Alternatively, compact busbar supply block KT7-_-A2E or -A3E meet Type E requirements for terminal spacing.
❺ Requires lockable twist knob (KT7-KN1 or KT7-KRY1 page F16) or lockable door coupling handle (KT7-HTN or KT7-HTRY page F15).

It should be noted that the KT7 Manual Motor Circuit Controller, when listed as a self-protected (Type E) device, is rated for Wye-connected power systems for voltages above 240 volts (i.e. 480Y/277 volts common in the United States or 600Y/347 volts common in Canada).

KTC7 Base Unit ❶

Maximum Horsepower						Current Adjustment Range [A]	Magnetic Release Response Current [A]	Catalog Number
Typical Single Phase		Typical Three Phase [HP]						
115V	230V	200V	230V	460V	575V			
KTC7-25S — Standard Interrupting Capacity								
~	~	~	~	~	~	0.10...0.16	3.2	**KTC7-25S-0.16A**
~	~	~	~	~	~	0.16...0.25	5.2	**KTC7-25S-0.25A**
~	~	~	~	~	1/4	0.25...0.40	8.2	**KTC7-25S-0.4A**
~	~	~	~	1/4	1/3	0.40...0.63	13	**KTC7-25S-0.63A**
~	~	~	~	1/2	3/4	0.63...1.0	21	**KTC7-25S-1A**
~	1/10	1/4	1/3	1	1	1.0...1.6	33	**KTC7-25S-1.6A**
1/10	1/6	1/2	3/4	1-1/2	2	1.6...2.5	52	**KTC7-25S-2.5**
1/8	1/3	1	1	3	3	2.5...4	82	**KTC7-25S-4A**
1/4	3/4	1-1/2	2	5	5	4...6.3	130	**KTC7-25S-6.3A**
1/2	1-1/2	3	3	7-1/2	10	6.3...10	208	**KTC7-25S-10A**
1	3	5	5	10	15	10...16	260	**KTC7-25S-16A**
KTC7-25H — High Interrupting Capacity								
1	3	5	5	10	10	10...16	260	**KTC7-25H-16A**
1-1/2	3	5	7-1/2	15	20	14.5...20	325	**KTC7-25H-20A**
KTC7-45H — High Interrupting Capacity								
2	3	7-1/2	10	20	25	18...25	416	**KTC7-45H-25A**
3	5	7-1/2	10	25	30	23...32	585	**KTC7-45H-32A**

Horsepower ratings shown in the table are for reference only.
The final selection of the controller depends on the actual motor full load current and service factor.

- *For motor with service factor less than 1.15.* Use motor nameplate full load current times 0.9 and choose the motor starter with the appropriate current range. Example: Motor F.L.C. = 4.2A; S.F. = 1.0. – 4.2A x 0.9 = 3.78A. Select Catalog Number KTC7-25S-4A.

KTC7-25S

Description

The KTC7 has a fixed magnetic trip set at 16…21x the maximum value of the current adjustment range (as opposed to the KTA7s magnetic trip of approximately 13x current adjustment range). KTC7 are typically used in applications where nuisance tripping might occur, as with some high efficiency motors.

❶ Magnetic trip is fixed at 16…21x the maximum value of the current adjustment range.

KTC7 UL Ratings Application Chart

Device	Manual Motor Starter		Manual Controller for Group Installation ❶			Manual Controller as Motor Disconnect ❷❺		Suitable for Tap Conductor Protection		Self-Protected Type E Manual Combination Controller ❸❹❺	
	Max. Short Circuit Current [kA]		Max. Fuse or Circuit Breaker	Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]	
	480V	600V		480V	600V	480V	600V	480Y/277V	600Y/347V	480Y/277V	600Y/347V
KTC7-25S — Standard Interrupting Capacity											
KTC7-25S-0.16A	65	47	450	65	47	65	47	65	47	65	47
KTC7-25S-0.25A	65	47	450	65	47	65	47	65	47	65	47
KTC7-25S-0.4A	65	47	450	65	47	65	47	65	47	65	47
KTC7-25S-0.63A	65	47	450	65	47	65	47	65	47	65	47
KTC7-25S-1A	65	47	450	65	47	65	47	65	47	65	47
KTC7-25S-1.6A	65	47	450	65	47	65	47	65	30	65	30
KTC7-25S-2.5A	65	25	450	65	25	65	25	65	25	65	25
KTC7-25S-4A	65	30	450	65	30	65	30	65	~	65	~
KTC7-25S-6.3A	65	30	450	65	30	65	30	65	~	65	~
KTC7-25S-10A	30	30	450	30	30	30	30	30	~	30	~
KTC7-25S-16A	30	30	450	30	30	10	10	10	~	10	~
KTC7-25H — High Interrupting Capacity											
KTC7-25H-16A	65	30	450	65	30	65	30	65	30	65	30
KTC7-25H-20A	30	30	450	30	30	30	30	30	~	30	~
KTC7-45H — High Interrupting Capacity											
KTC7-45H-25A	65	30	600	65	30	65	30	65	30	65	30
KTC7-45H-32A	65	30	600	65	18	65	18	65	18	65	18

❶ UL 508, CSA 22.2 No. 14 for group installation, in connection with short-circuit protection device.
❷ UL 508 Part III.
❸ UL 508 Part IV.
❹ Type E applications require use of the KT7-xx-TE terminal adaptor on KT7s. Alternatively, compact busbar supply block KT7-_-A2E or -A3E meet Type E requirements for terminal spacing.
❺ Requires lockable twist knob (KT7-KN1 or KT7-KRY1 page F16) or lockable door coupling handle (KT7-HTN or KT7-HTRY page F15).

It should be noted that the KT7 Manual Motor Circuit Controller, when listed as a self-protected (Type E) device, is rated for Wye-connected power systems for voltages above 240 volts (i.e. 480Y/277 volts common in the United States or 600Y/347 volts common in Canada).

KTB7 Base Unit ❷

Maximum Horsepower						❶ Rated Operational Current [A]	Magnetic Release Response Current [A]	Catalog Number
Typical Single Phase		Typical Three Phase [HP]						
115V	230V	200V	230V	460V	575V			
KTB7-25S — Standard Interrupting Capacity								
~	~	~	~	~	1/4	0.40	5.2	**KTB7-25S-0.4A**
~	~	~	~	1/2	3/4	1.0	13	**KTB7-25S-1A**
1/10	1/6	1/2	3/4	1-1/2	2	2.5	33	**KTB7-25S-2.5A**
KTB7-25…32H — High Interrupting Capacity								
1/10	1/6	1/2	3/4	1-1/2	2	2.5	33	**KTB7-25H-2.5A**
1/8	1/3	1	1	3	3	4	52	**KTB7-25H-4A**
1/2	1-1/2	3	3	7-1/2	10	10	130	**KTB7-25H-10A**
1	3	5	5	10	15	16	208	**KTB7-25H-16A**
2	3	7-1/2	7-1/2	20	20	25	325	**KTB7-25H-25A**
3	5	7-1/2	10	25	30	32	448	**KTB7-32H-32A**
KTB7-45H — High Interrupting Capacity								
2	3	7-1/2	10	20	25	25	325	**KTB7-45H-25A**
3	5	7-1/2	10	25	30	32	416	**KTB7-45H-32A**
3	7-1/2	10	15	30	40	45	585	**KTB7-45H-45A**

KTB7-25S

Description

The KTB7 is designed without a thermal trip element (i.e., current adjustment range). It should be selected for applications where a separate motor overload protection device is used, such as on CLT7 Three Component Starters on page F76. Magnetic trip is the same as the KTA7 (approximately 13x operational current).

❶ APPLICATION NOTE: Product Selection for Heavy Duty Starting Applications using KTB7-25S, KTB7-25H/32H and KTB7-45H Motor Circuit Controllers

The KTB7 Motor Circuit Controller is designed and tested to protect a motor circuit in case of a short circuit. A separate Sprecher + Schuh CEP7-EE_ overload relay with selectable trip class should be used to protect the motor against overload.

In Applications with motor starting times exceeding 10 seconds (heavy duty starting) the rated operational current (I_e) of the motor FLA must be multiplied by the following factors for selection of the KTB7 Motor Circuit Controller KTB7-25S, KTB7-25H/32H and KTB7-45H.

Trip classes according to UL 508 Section 52 and IEC 60947-4-1
CLASS 10 = 1.00 CLASS 15 = 1.22 CLASS 20 = 1.42
CLASS 25 = 1.58 CLASS 30 = 1.73
The maximum number of motor starts in 25 cycles/hour with a minimum OFF-time of 120 seconds between cycles. This additional calculation and selecting a larger frame size is necessary to compensate (dissipate) the increased heat resulting from long acceleration applications effecting the rated operational current of the KTB7.

Application Example:
Motor 480 VAC, 10 HP, Ie 14 FLA
Heavy duty starting application with start time of up to 18 seconds

Solution:
Starting time up to 18 seconds requires dimensioning for CLASS 20.
- Selection of the Motor Circuit Controller for Short Circuit Protection: Multiply the rated operational current I_e with factor for CLASS 20: $I_e(20)$ = 14 A x 1.42 = 19.9 A
- Select corresponding Sprecher + Schuh KTB7-25S, KTB7-25H/32H or KTB7-45H from catalog using next higher current rating: KTB7-25H-25A

❷ Horsepower ratings shown in the table are for reference only. The final selection of the controller depends on the actual motor full load current and service factor.
- For motor with service factor less than 1.15. Use motor nameplate full load current times 0.9 and choose the motor starter with the appropriate current range. Example: Motor F.L.C. = 4.2A; S.F. = 1.0. – (4.2A x 0.9 = 3.78A). Select Catalog Number KTB7-25S-4A.

KTB7 UL Ratings Application Chart

Device	Manual Motor Starter		Manual Controller for Group Installation ❶			Manual Controller as Motor Disconnect ❷	
	Max. Short Circuit Current [kA]		Max. Fuse or Circuit Breaker	Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]	
	480V	600V		480V	600V	480V	600V
KTA7-25S — Standard Interrupting Capacity							
KTB7-25S-0.4A	65	47	450	65	47	65	47
KTB7-25S-1A	65	47	450	65	47	65	47
KTB7-25S-2.5A	65	30	450	65	30	65	30
KTA7-25…32H — High Interrupting Capacity							
KTB7-25H-2.5A	65	30	450	65	30	65	30
KTB7-25H-4A	65	30	450	65	30	65	30
KTB7-25H-10A	65	30	450	65	30	65	30
KTB7-25H-16A	65	30	450	65	30	65	30
KTB7-25H-25A	30	30	450	30	30	30	30
KTB7-32H-32A	30	30	450	30	30	30	18
KTA7-45H — High Interrupting Capacity							
KTB7-45H-25A	65	30	600	65	30	65	30
KTB7-45H-32A	65	30	600	65	30	65	30
KTB7-45H-45A	65	18	600	65	18	65	18

❶ UL 508, CSA 22.2 No. 14 for group installation, in connection with short-circuit protection device.
❷ UL 508 Part III.

KTV7 Base Unit

Rated Operational Current (I_e)	Current Adjustment Range [A]	Nominal Magnetic Trip Current	Maximum Short Circuit Current [kA]		Maximum Horsepower Typical ❶❷ Three Phase [HP]				Catalog Number
[A]	[A]	[A]	480Y/277V Type E	480V (group motor)	200V	230V	460V	575V	
KTV7-25H…32H — High Interrupting Capacity									
1.6	1.0…1.6	82	65	65	1/4	1/3	1	~	**KTV7-25H-1.6A**
2.5	1.6...2.5	82	65	65	1/2	3/4	1-1/2	~	**KTV7-25H-2.5A**
4.0	2.5...4.0	82	65	65	1	1	3	~	**KTV7-25H-4A**
6.3	4.0...6.3	82	65	65	1-1/2	2	5	~	**KTV7-25H-6.3A**
10	6.3...10	130	65	65	3	3	7-1/2	~	**KTV7-25H-10A**
16	10...16	208	65	65	5	5	10	~	**KTV7-25H-16A**
20	14.5...20	260	65	65	5	7-1/2	15	~	**KTV7-25H-20A**
25	18...25	325	30	30	7-1/2	7-1/2	20	~	**KTV7-25H-25A**
29	24...29	406	~	30	7-1/2	10	20	~	**KTV7-32H-29A**
32	27...32	448	~	30	7-1/2	10	25	~	**KTV7-32H-32A**

KTV7-25H

Horsepower ratings shown in the table are for reference only. ***The final selection of the controller depends on the actual motor full load current and service factor.***

- *For motor with service factor less than 1.15.* Use motor nameplate full load current times 0.9 and choose the motor starter with the appropriate current range. Example: Motor F.L.C. = 4.2A; S.F. = 1.0. – 4.2A x 0.9 = 3.78A. Select Catalog Number KTV7-25H-4A.

Description

The Sprecher+Schuh KTV7 series motor controllers are suitable for two types of applications under cULus listings:

(1) as a Manual, Self-protected Motor Controller or

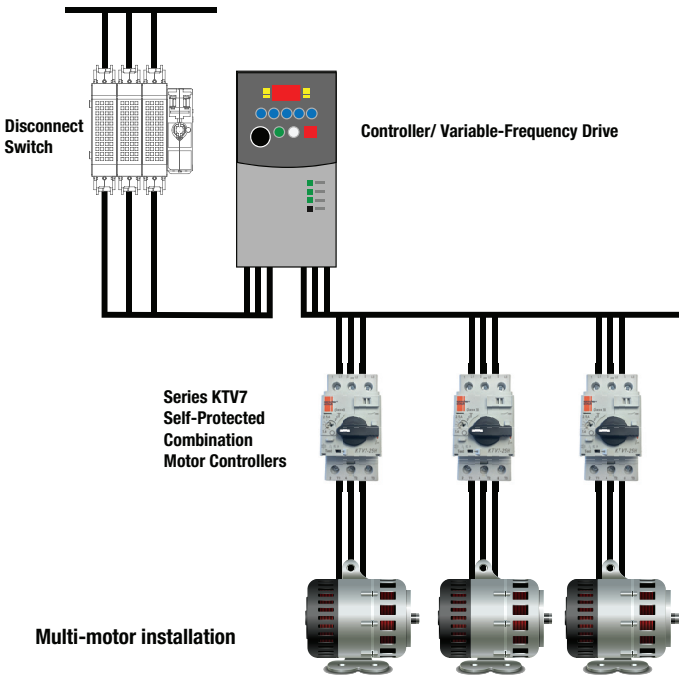
(2) as a Manual Motor Controller with approval for group installation (and as a motor disconnect)

When UL/CSA listed as a manual, self-protected combination motor controller, the KTV7 provides all of the necessary NEC requirements for protection and control of individual motor branch circuits without additional protective devices (per NEC 430-52C option 6).

When KTV7 devices are applied a manual motor controllers in group installations, then NEC group installation rules state these devices must be applied per the appropriate rules, which require the use of an upstream BCPD-branch circuit protection device (per NEC 430-53C option 2).

The output frequency of the VFD must be limited to 400Hz or less to prevent thermal degradation. Various models of the KTV7 series self-protected combination motor controllers provide disconnection for motor branch circuits, branch-circuit and short-circuit protection (including magnetic protection), overload/thermal protection and manual switching.

The KTV7 self-protected combination motor controllers are current limiting and have a fixed magnetic trip. Interrupt ratings at 400V and 480V are available up to 65KaIC. The VFD output pulse-width modulation frequency must be limited to 4 kilohertz or less. The circuit breakers provide motor overload protection with a trip class 10 characteristic.



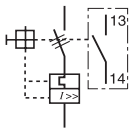
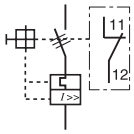
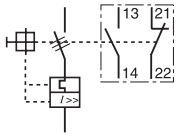
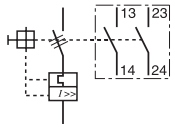
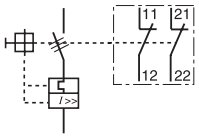
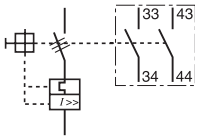
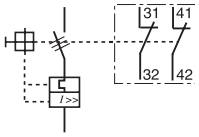
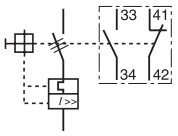
❶ HP ratings shown are for reference. Final selection of MPCB is determined by actual motor full load current.
❷ Not applicable at 575V.

KTV7 UL Ratings Application Chart

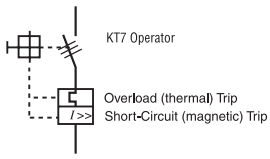
Device	Manual Controller for Group Installation ❶			Manual Controller as Motor Disconnect ❷❺		Suitable for Tap Conductor Protection		Self-Protected Type E Manual Combination Controller ❸❹❺	
	Max. Fuse or Circuit Breaker	Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]		Max. Short Circuit Current [kA]	
		480V	600V	480V	600V	480Y/277V	600Y/347V	480Y/277V	600Y/347V
KTV7-25H…32H — High Interrupting Capacity									
KTV7-25H-1.6A	450	65	~	65	~	65	~	65	~
KTV7-25H-2.5A	450	65	~	65	~	65	~	65	~
KTV7-25H-4A	450	65	~	65	~	65	~	65	~
KTV7-25H-6.3A	450	65	~	65	~	65	~	65	~
KTV7-25H-10A	450	65	~	65	~	65	~	65	~
KTV7-25H-16A	450	65	~	65	~	65	~	65	~
KTV7-25H-20A	450	65	~	65	~	65	~	65	~
KTV7-25H-25A	450	30	~	30	~	30	~	30	~
KTV7-32H-29A	450	30	~	30	~	~	~	~	~
KTV7-32H-32A	450	30	~	30	~	~	~	~	~

❶ UL 508, CSA 22.2 No. 14 for group installation, in connection with short-circuit protection device.
❷ UL 508 Part III.
❸ UL 508 Part IV.
❹ Type E applications require use of the KT7-xx-TE terminal adaptor on KT7s. Alternatively, compact busbar supply block KT7-_-A2E or -A3E meet Type E requirements for terminal spacing.
❺ Requires lockable twist knob (KT7-KN1 or KT7-KRY1 page F16) or lockable door coupling handle (KT7-HTN or KT7-HTRY page F15).

Accessories for KT7

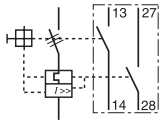
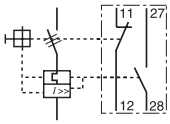
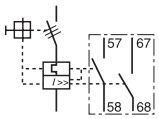
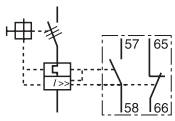
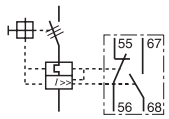
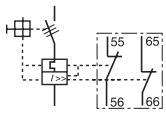
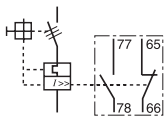
Accessory	Description	Operator Position ❶ OFF	Operator Position ❶ ON	Operator Position ❶ Tripped	Type	Connection Diagram and Terminal Markings ❷	For Use With	Catalog Number
	**Front-Mounted Auxiliary Contact** • 1-pole or 2-pole • No additional space required • 300V max.	0	X	0	1 NO		KTA7KTB7/ KTC7/KTV7 KTU7 ❸	**KT7-PE1-10**
		X	0	X	1 NC		KTA7/KTB7/ KTC7/KTV7 KTU7 ❸	**KT7-PE1-01**
		0	X	0	1 NO		KTA7/KTB7/ KTC7/KTV7 KTU7 ❸ KF7	**KT7-PE1-11**
		X	0	X	1 NC			
		0	X	0	1 NO		KTA7/KTB7/ KTC7/KTV7 KTU7 ❸	**KT7-PE1-20**
		0	X	0	1 NO			
		X	0	X	1 NC		KTA7/KTB7/ KTC7/KTV7 KTU7 ❸	**KT7-PE1-02**
		X	0	X	1 NC			
	**Right Side-Mounted Auxiliary Contact** • 2-pole • Adds 9 mm to the width of the device • 600V max.	0	X	0	1 NO		KTA7 KTB7 KTC7 KTV7	**KT7-PA1-20**
		0	X	0	1 NO			
		X	0	X	1 NC		KTA7 KTB7 KTC7 KTV7	**KT7-PA1-02**
		X	0	X	1 NC			
		0	X	0	1 NO		KTA7 KTB7 KTC7 KTV7	**KT7-PA1-11**
		X	0	X	1 NC			

❶ X=Contact Closed
O=Contact Open

❷ 

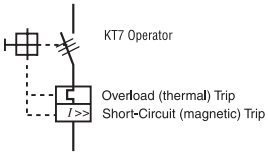
❸ When KT7-PE_ is used with KTU7 Circuit Breakers, KT7-PEFC Load Terminal Cover is required to comply with UL489 terminal clearance standards.

Accessories for KT7

Accessory	Description	Operator Position ❶ OFF	Operator Position ❶ ON	Operator Position ❶ Tripped	Type	Connection Diagram and Terminal Markings ❷	For Use With	Catalog Number
	**Front-Mounted Trip Contact** • 2-pole • Indicates tripping of device • No additional space required • 300V max.	0	X	0	1 NO		KTA7/ KTB7/ KTC7/ KTV7 KTU7 ❸	**KT7-PEF1-S10-N10**
		0	0	X	NO Trip (Short-Circuit & Overload)			
		X	0	X	1 NC		KTA7/ KTB7/ KTC7/ KTV7 KTU7 ❸	**KT7-PEF1-S10-N01**
		0	0	X	NO Trip (Short-Circuit & Overload)			
	**Right Side-Mounted Trip Contact** • 2-pole • Indicates tripping of motor protector • Adds 9 mm to the width of the device • 600V max.	0	0	X	NO Trip (Short-Circuit & Overload)		KTA7 KTB7 KTC7 KTV7	**KT7-PAF1-S10-M10**
		0	0	X	NO Trip (Short-Circuit)			
		0	0	X	NO Trip (Short-Circuit & Overload)		KTA7 KTB7 KTC7 KTV7	**KT7-PAF1-S10-M01**
		X	X	0	NC Trip (Short-Circuit)			
		X	X	0	NC Trip (Short-Circuit & Overload)		KTA7 KTB7 KTC7 KTV7	**KT7-PAF1-S01/M10**
		0	0	X	NO Trip (Short-Circuit)			
		X	X	0	NC Trip (Short-Circuit & Overload)		KTA7 KTB7 KTC7 KTV7	**KT7-PAF1-S01-M01**
		X	X	0	NC Trip (Short-Circuit)			
		0	0	X	NO Trip (Short-Circuit)		KTA7 KTB7 KTC7 KTV7	**KT7-PAF1-M11**
		X	X	0	NC Trip (Short-Circuit)			

❶ X=Contact Closed
O=Contact Open

❷

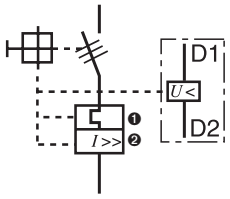


❸ When KT7-PE_ is used with KTU7 Circuit Breakers, KT7-PEFC Load Terminal Cover is required to comply with UL489 terminal clearance standards.

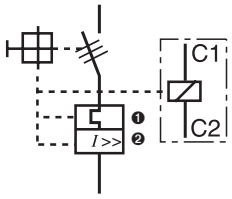
Accessories for KT7

Accessory	Description	For Use With	AC Coil Voltage		Catalog Number	
			50 HZ	60 HZ	Shunt Trip	Undervoltage
	**Undervoltage Trip** • Left-side mounted • Adds 18 mm to the width of the KT7 device • Automatically trips motor protector when voltage falls below 35…70%	KTA7 KTB7 KTC7 KTV7	12V	14V	**KT7-AA-14V**	**KT7-UA-14V**
			21V	24V	**KT7-AA-24V**	**KT7-UA-24V**
			24V	28V	**KT7-AA-28V**	**KT7-UA-28V**
			42V	48V	**KT7-AA-48V**	**KT7-UA-48V**
			110V	**120V**	**KT7-AA-120V**	**KT7-UA-120V**
			110V	127V	**KT7-AA-127V**	**KT7-UA-127V**
			220...230V		**KT7-AA-230V**	**KT7-UA-230V**
				240...260V	**KT7-AA-240V**	**KT7-UA-240V**
			240V	277V	**KT7-AA-277V**	**KT7-UA-277V**
			380V	460V	**KT7-AA-460V**	**KT7-UA-460V**
			415V	**480V**	**KT7-AA-480V**	**KT7-UA-480V**
			525V	600V	**KT7-AA-600V**	**KT7-UA-600V**
	Shunt Trip • Left-side mounted • Adds 18 mm to the width of the KT7 device • Trips motor protector when voltage is applied remotely	KTU7	**DC Coil Voltage**		**Shunt Trip**	**Undervoltage**
			9V DC		**KT7-AA-9D**	**KT7-UA-9D**
			12V DC		**KT7-AA-12D**	**KT7-UA-12D**
			24V DC		**KT7-AA-24D**	**KT7-UA-24D**
			36V DC		**KT7-AA-36D**	**KT7-UA-36D**
			48V DC		**KT7-AA-48D**	**KT7-UA-48D**
			60V DC		**KT7-AA-60D**	**KT7-UA-60D**
			64V DC		**KT7-AA-64D**	**KT7-UA-64D**
			72V DC		**KT7-AA-72D**	**KT7-UA-72D**
			80V DC		**KT7-AA-80D**	**KT7-UA-80D**

Undervoltage Trip Connection Diagram



Shunt Trip Connection Diagram



❶ For Overload (thermal) Trip of KT7.
❷ For Short-Circuit (magnetic) Trip of KT7.

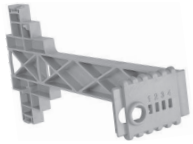
Classic Handle Assembly, Type 1/4/4X/12

Accessory	Description	Color	Legend ❷	For use with...	Frame Size (Length)	Catalog Number
	**Classic Door Coupling Handle ❶❷❸** • For 3 padlocks 4...8 mm (5/16") diameter • Type 1/3/3R/4/4X/12 and IP66 • Interlock override capability • Can be modified for locking in ON position • Ships with coupling — order extension shaft and legend plate separately • See Technical Section for mounting depth information	Gray/Black	O - I OFF -ON Trip	KTA7, KTB7, KTC7, KTV7 ❶❷ KTU7 ❸	65 x 65mm	**KT7-HTN**
		Red/Yellow	O - I OFF -ON Trip		65 x 65mm	**KT7-HTRY**
	**Extension Shaft ❶** • Cut to required length for mounting depth (adapter-door) • See Technical Section for mounting depth information			KT7-HTN KT7-HTRY	250 mm	**KT7-HT**
					400 mm	**KT7-HTL**

Contemporary Handle Assembly, Type 3R/3/4/4X

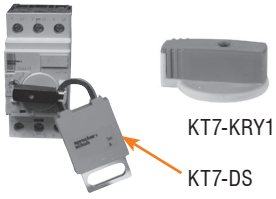
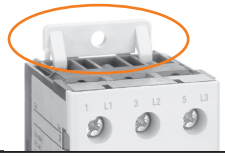
Accessory	Description	Color	Legend ❷	For use with...	Frame Size (Length)	Catalog Number
	**Contemporary Door Coupling Handle ❺** • Screw Fixing • Type 3R, 3, 12, 4, 4X, IP66 • Field configurable for defeatable or non-defeatable • Ships with coupling — order extension shaft and legend plate separately • Requires 30mm hole for mounting • For up to 2 padlocks	Black/Black	O - I OFF -ON Trip	KTA7 KTB7 KTC7 KTV7 KTU7	48.7 x 47mm	**KT7-SB**
		Red/Yellow	O - I OFF - ON Trip		48.7 x 47mm	**KT7-SY**
	**Extension Shaft** • Cut to required length for mounting depth (adapter-door) • See Technical Section for mounting depth information			KT7-SB KT7-SY	305mm (12")	**KT7-S1**
					533mm (21")	**KT7-S2**

Handle Accessories

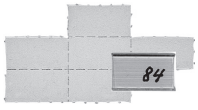
Accessory	Description	For use with...	Catalog Number
	**Extension Shaft Support ❹** • Provides consistent alignment of the KT7 shafts with handle or door coupling • Recommended for shaft lengths >200mm (7.8 in) • 9mm in width and snaps on right side of KT_7 devices • Allows for one side-mount auxiliary	KT7-HT_ KT7-S_ KT7-N_	**KT7-SHS**
	**Legend Plate** • Marking: "Haupschalter" and "Main Switch" (Black/Gray) • Marking: "Not-Aus" and "Emergency Off" (Black/Yellow)	KT7-HT_ KT7-S_	**KT7-HTFCN** **KT7-HTFCRY**

❶ See Dimensions and Technical data in this section for design compatibility.
❷ KTA7, KTB7 and KTC7 can be used with Series D or later KT7-H_ Handle mechanism with "I-O" markings or Series E with "ON-OFF" markings.
❸ KTU7 requires Series E or later to comply with UL489 "ON-OFF" Trip markings.
❹ See page F41 for assembly example and dimensions.
❺ See page F42 for KT7-S_ handle dimensions.

Accessories for KT_7

Accessory	Description	Color	For Use With	Catalog Number
 KT7-KRY1 KT7-DS	**Lockable Twist Knob** • For 1 padlock 4...5 mm (1/4") dia. shackle • Can be locked in OFF position	Black	KTA7, KTB7, KTC7, KTV7 KTU7	**KT7-KN1**
		Red/Yellow		**KT7-KRY1**
	Locking Tag • Padlock attachment to the lockable handles • Up to three padlocks 4...8 mm (5/16") shackle	Red	KT7-KN1 KT7-KRY1 KT7-45-KRY	**KT7-DS**
	**Terminal Adapter for Type E Applications** ❶ • Required on all KT7s used in UL Type E applications • May not be used with Bus Bars		KTA/B/C7/V7-25/32	**KT7-25-TE1**
			KTA/B/C7-45	**KT7-45-TE**
	**Anti-Tamper Shield** • Provides protection against inadvertent adjustment of the current setting • 10 pieces per package (price per piece)		KTA7 KTB7 KTC7 KTV7	**KT7-25-CA**
	**Screw Adaptor** • For screw fixing of KT7 Motor Circuit Controller • 10 pieces per package (price per piece)		KTA7 KTB7 KTC7 KTV7 KTU7	**KT7-45-AS**

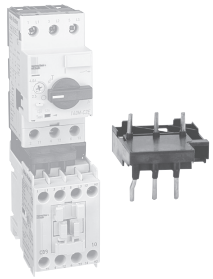
Marking Systems

Component	Description	Pkg. Qty.	Catalog Number
	**Label Sheet -** 1 sheet with 105 self-adhesive paper labels each, 6 x17mm	1	**CA7-FMS**
	**Marking Tag Sheet -** 1 sheet with 160 perforated paper labels each, 6 x 17mm. To be used with transparent cover	1	**CA7-FMP**
	Transparent Cover - To be used with Marking Tag Sheets	100 ❷	**CA7-FMC**
	Tag Carrier - For marking with marker cards and tags. See page N6 for complete listing of available cards and tabs.	100 ❷	**CA7-FMA2**

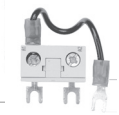
❶ Terminal Adaptors are supplied as standard on enclosed KT7 and CX7 starters, as well as, CL8, CL7 and CK7 assembled products, assuring they can be used in Type E applications. Alternatively, compact busbar supply block KT7-_-A2E or -A3E meet Type E requirements for terminal spacing.
❷ Minimum quantity is one package of 100. Price is each x 100 = total price.

DISCONTINUED

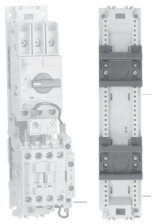
Connecting Modules *(for connecting KTA7, KTB7 or KTC7 to CA8, CA7 AC coil, or CA7 Electronic DC coil contactors)* ❷

Module	Description	For Connecting. . .	To Contactor. . .	Catalog Number ❶
	**Connecting Modules (forms Ecombo Starter) - ❶** • Provides electrical and mechanical interconnection of KT7 and CA8 (with AC or DC coils), CA7 (with AC coils) or CA7-_E (with Electronic DC coils). • Suitable for reversing and wye-delta kits • Ecombo starter (with KT7-25/32) mounts on a single DIN-rail (KT7 mounts on DIN-rail) • Ecombo starter (with KT7-45) can be mounted on two DIN-rails or on Mounting Modules (see selection table below) • Contactor coil mounted on load side	KT_7-25S..32S or KF7	CA8-9...12 12A max.	**KT7-25S-PEK12**
		KT_7-25S..32S or KF7	CA7-9...23 CA7-9E...23E	**KT7-25S-PEC23**
		KT_7-25H..32H	CA7-9...23 CA7-9E...23E	**KT7-25H-PEC23**
		KT_7-25H..32H	CA7-30...37 CA7-30E...37E	**KT7-25H-PNC37**
		KT_7-45H	CA7-30...37 CA7-30E...37E	**KT7-45H-PNC37**
		KT_7-45H	CA7-43 CA7-43E	**KT7-45H-PNC43**

Connecting Modules *(for connecting KTA7, KTB7 or KTC7 to CA7 to make CLT7 type assemblies)* ❷

Module	Description	For Connecting…	To Contactor. . .	Use Connector. . . ❶	With Coil Module. . .
 KT7-25S-PNC23  KT7-25S-PSC23	**Connecting Modules** • Provides electrical interconnection of KT7 and CA7 contactors • Contactor Coil Module extends A1/A2 Line Side terminals forward to facilitate wiring • Contactor and motor protector must be mounted on two DIN-rails or on Mounting Module (see selection table below)	KT_7-25S..32S or KF7	CA7-9..23	**KT7-25S-PNC23**	**KT7-25S-PSC23**
		KT_7-25H..32H		**KT7-25H-PNC23**	
		KT_7-25H..32H	CA7-30..37	**KT7-25H-PNC37**	**KT7-45H-PSC43**
		KT_7-45H		**KT7-45H-PNC37**	
		KT_7-45H	CA7-43	**KT7-45H-PNC43**	

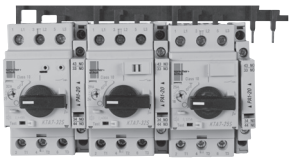
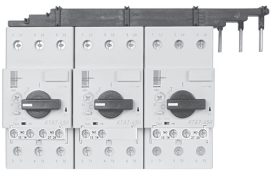
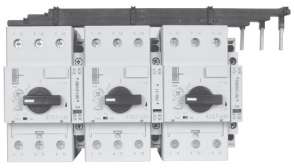
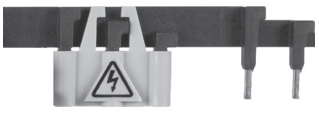
Type W Mounting Modules

Module	Description	Width (mm)	Catalog Number
	**Short Mounting Module -** Requires Connecting Module from tables above • Provides support for KT7 + CA7 or CA8 • Top rail is specifically designed for KT7 • Bottom rail is movable for easy assembly and disassembly • Complete unit mounts to two 35mm DIN-rails or one 70mm DIN-rail or screw mounts • 228 mm long	45	**W-32489**
		54	**W-32490**
	**Long Mounting Module -** See Section D for Connecting Modules • Provides support for KT7 + PCS Softstarter, CA7 + PCS Softstarter or KTB7 + CA7+CEP7 • Top rail is specifically designed for KT7 • Bottom rail is movable for easy assembly and disassembly • Complete unit mounts to two 35mm DIN-rails or one 70mm DIN-rail or screw mounts • 283 mm long	45	**W-32496**
		54	**W-32497**
	**Spacer for Mounting Module -** Fits between 45mm and 54mm for Reversing applications (228 mm long)	9	**W-32955**
	**Dovetail Joints -** Used to connect two mounting modules together. (Sold in packages of 50)		**W-32954**

❶ cURus Approved (File # E33916).
❷ Not for use with KTU7 Circuit Breakers

DISCONTINUED

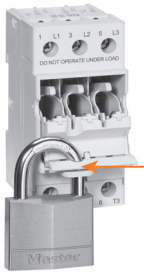
Compact Busbar System for KTA7, KTB7 and KTC7 Motor Controlers ❶❷❹

Accessory	Description	For Use With	Catalog Number
	**Compact Busbar — 45 mm Spacing (Rated 64 A)** • For use with front-mounted auxiliary contact on KT_7 Motor Controllers Connects 2 Motor Controllers Connects 3 Motor Controllers Connects 4 Motor Controllers Connects 5 Motor Controllers	KT_7-25…32S KT_7-25…32H ❸	**KT7-32-DB-45-2** **KT7-32-DB-45-3** **KT7-32-DB-45-4** **KT7-32-DB-45-5**
	**Compact Busbar — 54 mm Spacing (Rated 64 A)** • For use with side-mounted auxiliary contact on KT_7 Motor Controllers Connects 2 Motor Controllers Connects 3 Motor Controllers Connects 4 Motor Controllers Connects 5 Motor Controllers	KT_7-25…32S KT_7-25…32H ❸	**KT7-32-DB-54-2** **KT7-32-DB-54-3** **KT7-32-DB-54-4** **KT7-32-DB-54-5**
	**Compact Busbar — 54mm Spacing (Rated 120 A)** • For use with front-mounted auxiliary contact on KT_7 Motor Controllers Connects 2 Motor Controllers Connects 3 Motor Controllers Connects 4 Motor Controllers	KT_7-45H	**KT7-45-DB-54-2** **KT7-45-DB-54-3** **KT7-45-DB-54-4**
	**Compact Busbar — 63 mm Spacing (Rated 120 A)** • For use with side-mounted auxiliary contact on KT_7 Motor Controllers Connects 2 Motor Controllers Connects 3 Motor Controllers Connects 4 Motor Controllers	KT_7-45H	**KT7-45-DB-63-2** **KT7-45-DB-63-3** **KT7-45-DB-63-4**
 KTA7-25S to 25H KBH2	**Spacer for KT_7-25…32H to KT_7-25…32S** • Accommodates difference in depth from KT_7-25H…32H to KT_7-25S…32S • Aligns terminals for compact bus bar connection	KT_7-25…32S to KT_7-25…32H ❸	**KBH2**
 A2E  A3E	**Supply Block and Terminal** • For power connection to Compact Busbar — 600V, KT_7-25/32…63A max. / KT_7-45…120A maximum • Top feed — overlaps commoning link • Meets requirements for terminal spacing from source in Type E applications • KT7-25-A2E and KT7-45-A2E are primarily used for bottom cable feed	KT_7-25…32S or KT_7-25…32H ❸	**KT7-25-A2E** **KT7-32-A3E**
		KT_7-45H	**KT7-45-A2E** **KT7-45-A3E**
	**Terminal Cover** • For covering of unused connection terminals • IP2X finger protection	KT_7-25...32 KT_7-45H	**KT7-32-DBA** **KT7-45-DBA**

❶ UL Approved (File #E33916); CSA Approved (File #13908).
❷ Compact busbar may not be applied with KT7-25-TE1 or KT7-45-TE Terminal Adaptors. Either Terminal Adaptors or Bus Bar may be used, not both.
❸ KT7-25…32S and KT7-25…32H may not be combined without KBH2.
❹ Not for use with KTU7 Circuit Breakers

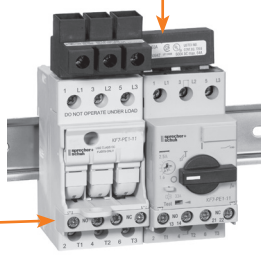
KF7 Fuse Holder to be used with KT7 or CA8/CA7 ❺

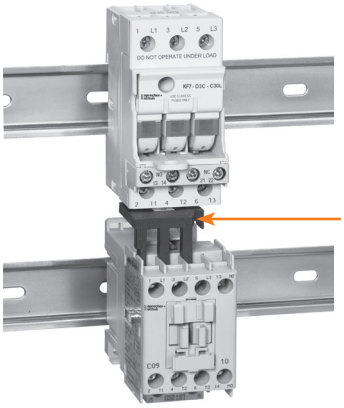
Accessory	Description	Approvals		Catalog Number
		IEC/CE	UL/CSA	
	KF7 Fuse Holder, CC - 30A	Yes	Yes	**KF7-D3C-C30**
 Blown Fuse Indicator	KF7 Fuse Holder with Blown Fuse Indication, CC - 30A	Yes	Yes	**KF7-D3C-C30L**



Lockable in Open Position

KF7 is Compatible with KT7 Compact Busbar ❹





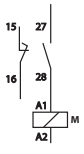
Connector to Contactor
❶
❷
❸

Applying KF7 with KTA7 Motor Circuit Controllers and CA7 Contactors

KF7 can be applied on the line side of a multiple small KTA7 motor circuit controller or a single KTA7 controller and CA7 contactors to increase the short-circuit protection of the group or a single branch circuit. KF7 is compatible with the KT7 compact bus bars (as shown in Section F), which reduces the space requirement as well as installation time.

Applying KF7 with CA7 Contactors

KF7 can be applied on the line side of CA7 contactors to increase the short-circuit withstand rating. The cUL withstand rating of CA7 when protected by Type “CC” fuses is increased to 100KAIC as shown on page A72.

Accessory	Connection Diagram	Description	Catalog Number
		**Auxiliary Contact for KF7 Fuse Holder (1 NO Late Make + NC Early Break)** • NO Late Make, provides positive indication that power circuit is open • NC Early Break, provides capability for dropping out contactor before breaking current on fuse	**KF7-PE1-11**

❶ The KF7 terminal spacing and height are the same as KT_7-25S. Reference page F17 tables to select a connector.
❷ If using a KT7-25S-PEK12 (with CA8) or KT7-25S-PEC23 (with CA7), close couple connector, then the pair mounts on a single DIN rail under the KF7.
❸ Using a KT7-25S-PNC23 to mount a KF7 with a standard CA7 with AC Coil requires two DIN rails.
The A1-A2 terminals of a standard CA7 with AC Coil can be turned to the load side. In this case a KT7-25S-PSC23 would not be required.
❹ KF7 can not be mounted directly to a KT_7 using a PEK, PEC or PNC Connector. KF7, used in connection with a Compact Bus Bar, can provide Group Fusing protection for multiple bus bar connected KT_7.
❺ For dimensions and wiring diagrams see page F44.