

# Motor protection switches

## MS32, MSB32, MS18, MSB18



- Versions:
  - MS32 / MS18 - with thermal and magnetic releases
  - MSB32 / MSB18 - with a thermal release only
- Manual control:
  - START, STOP, push-buttons - with a trip indication (i.e. push-buttons stay in the middle position)
- Automatic switch-off at over-current with thermal or magnetic release
- Control with under-voltage release or shunt release
- An auxiliary switch for side mounting or flush mounting used for indication of the switching state
- Indication of release with trip indicating auxiliary switch
- ON/OFF buttons position unequivocally indicates switching position of main circuit contacts
- Contact material
  - Resistant to contact welding
  - Enables low contact heating
- Isolating distance between contacts: 4.5 mm per contact place
- Connection of a rigid or flexible conductor
- Assembly to 35 mm wide mounting rail in compliance with EN 60715
- Vertical or horizontal operational position

### TECHNICAL DATA

GENERAL	Standards			IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-5-1, IEC/EN 60204, UL 508, CSA 22.2 No.14
	Approvals			UL
	Climatic class			constant damp heat acc. to IEC 60068-2-78 cyclic damp heat acc. to IEC 60068-2-30
	Degree of protection			IP20, after terminals covering IP40
	Ambient temperature		°C	-25 ... +60
	Storage temperature		°C	-25 ... +70
	Temperature range of thermal compensation for overload release		°C	-5 ... +40
	Mechanical and electrical endurance		op. c.	100,000
	Max. operating cycles		op. / h	25
	Shock resistance acc. to IEC 68-2-27		g	20
	Vibration resistance acc. to IEC 68-2-6			5 g at f = 5 ... 150 Hz
	Overvoltage category / pollution degree			III / 3
	Rated insulation voltage	$U_i$	V	690
	Rated impulse withstand voltage	$U_{imp}$	kV	6
Weight		kg	0.279	
MAIN CIRCUIT	Designation of connection terminals			1 – L1 ; 3 – L2 ; 5 – L3 ; 2 – T1 ; 4 – T2 ; 6 – T3
	Terminal capacity	rigid flexible	S	mm <sup>2</sup> 0.75 ... 10 0.75 ... 6
	Screw			with self-lifting clamp, protected against drop out
	Screw head			PZ2
	Tightening torque			Nm 2.0



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MAIN CIRCUIT			MS32 / MS18	MSB32 / MSB18	
	Max. operational voltage	U <sub>e</sub>	V	690	400
	Setting range		A	0.1 - 0.16; 0.16 - 0.25; 0.25 - 0.4; 0.4 - 0.63; 0.63 - 1; 1 - 1.6; 1.6 - 2.5; 2.5 - 4; 4 - 6.3; 6.3 - 10; 9 - 14; 13 - 18; 17 - 23 (only MS32); 20 - 27 (only MS32); 25 - 32 (only MS32)	0.25 - 0.4; 0.4 - 0.63; 0.63 - 1; 1 - 1.6; 1.6 - 2.5; 2.5 - 4; 4 - 6.3; 6.3 - 10; 9 - 14; 13 - 18; 17 - 23 (only MSB32); 20 - 27 (only MSB32); 25 - 32 (only MSB32)
	No. of poles			3	
	Operating current of thermal overload release	I		1,05 I <sub>r</sub> < I ≤ 1,20 I <sub>r</sub> I <sub>r</sub> ...current setting value	
	Sensitivity to phase failure			yes	
	Power dissipation per pole at the upper setting limit	P	W	2 - 2,5	
	Utilization category acc. to IEC/EN 60947-4-1			AC-3	
	acc. to IEC/EN 60947-2			A	
	Trip class acc. To IEC/EN 60947-4-1			10	

### SWITCH SELECTION FOR MOTOR PROTECTION

Standard motor powers						Setting range
Single-phase	Three-phase					
220 V 230 V 240 V	220 V 230 V 240 V	380 V 400 V 415 V	440 V	500 V	660 V 690 V	
kW						A
					0.06	0.1 ... 0.16
		0.06	0.06	0.06 ... 0.9	0.06 ... 0.12	0.16 ... 0.25
	0.06	0.09	0.12	0.09 ... 0.12	0.18	0.25 ... 0.4
	0.09	0.12 ... 0.18	0.18	0.18	0.25	0.4 ... 0.63
0.06 ... 0.09	0.09 ... 0.12	0.18 ... 0.25	0.25 ... 0.37	0.25 ... 0.37	0.37 ... 0.55	0.63 ... 1
0.12	0.18 ... 0.25	0.37 ... 0.55	0.37 ... 0.55	0.55 ... 0.75	0.75 ... 1.1	1 ... 1.6
0.18 ... 0.25	0.37	0.75	0.75 ... 1.1	1.1	1.5	1.6 ... 2.5
0.37	0.55 ... 0.75	1.1 ... 1.5	1.5	1.5 ... 2.2	2.2 ... 3	2.5 ... 4
0.55 ... 0.75	1.1 ... 1.5	2.2	2.2 ... 3	2.2 ... 3	4	4 ... 6.3
1.1 ... 1.5	1.5 ... 2.2	3 ... 4	4	4 ... 5.5	5.5 ... 7.5	6.3 ... 10
2.2	2.2 ... 3	5.5	5.5 ... 7.5	5.5 ... 7.5	9 ... 11	9 ... 14
3	4	7.5	7.5 ... 9	9 ... 11	15	13 ... 18
	5.5	9 ... 11	11	11	15 ... 18.5	17 ... 23
	5.5 ... 7.5	11	11	15	18.5 ... 22	20 ... 27
	7.5	15	15	18.5	22	25 ... 32

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MS32 motor protection switches, rated ultimate and service short-circuit breaking capacity  $I_{cu}$  and  $I_{cs}$ , and max. back-up fuses if short circuit current  $I_{cp}$  exceeds  $I_{cu}$ :

Type		Operating current of short-circuit release (A)	Rated ultimate short-circuit breaking capacity $I_{cu}$ , $I_{cs}$ (kA)								Max. back-up fuse, if $I_{cp} > I_{cu}$ (gL) (A)			
			230 V		400 V		500 V		690 V		230 V	400 V	500 V	690 V
			$I_{cu}$	$I_{cs}$	$I_{cu}$	$I_{cs}$	$I_{cu}$	$I_{cs}$	$I_{cu}$	$I_{cs}$				
MS32 - 0.16	MS18 - 0.16	2	100	100	100	100	100	100	100	100	No back-up fuse required			
MS32 - 0.25	MS18 - 0.25	3	100	100	100	100	100	100	100	100				
MS32 - 0.4	MS18 - 0.4	5	100	100	100	100	100	100	100	100				
MS32 - 0.63	MS18 - 0.63	8	100	100	100	100	100	100	100	100				
MS32 - 1	MS18 - 1	13	100	100	100	100	100	100	100	100				
MS32 - 1.6	MS18 - 1.6	22	100	100	100	100	100	100	100	100				
MS32 - 2.5	MS18 - 2.5	33	100	100	100	100	100	100	5	5				
MS32 - 4	MS18 - 4	55	100	100	100	100	100	100	3	3			25	
MS32 - 6.3	MS18 - 6.3	84	100	100	100	100	6	4.5	3	2			35	35
MS32 - 10	MS18 - 10	126	100	100	100	100	6	4.5	3	2			50	35
MS32 - 14	MS18 - 14	170	25	12.5	25	12.5	6	4.5	3	2	80	63	50	50
MS32 - 18	MS18 - 18	230	25	12.5	25	12.5	6	4.5	3	2	80	63	50	50
MS32 - 23		270	25	12.5	25	12.5	4	3	3	2	80	80	50	50
MS32 - 27		360	25	12.5	25	12.5	4	3	3	2	80	80	50	50
MS32 - 32		400	25	12.5	25	12.5	4	3	3	2	80	80	50	50

MSB32 / MSB18 motor protection switches and max. back-up fuses for short-circuit protection:

Type		Max. back-up fuse $U_e < 400$ V gL (A)
MSB32 - 0.4	MSB18 - 0.4	2
MSB32 - 0.63	MSB18 - 0.63	2
MSB32 - 1	MSB18 - 1	4
MSB32 - 1.6	MSB18 - 1.6	6
MSB32 - 2.5	MSB18 - 2.5	6
MSB32 - 4	MSB18 - 4	10
MSB32 - 6.3	MSB18 - 6.3	16
MSB32 - 10	MSB18 - 10	25
MSB32 - 14	MSB18 - 14	25
MSB32 - 18	MSB18 - 18	35
MSB32 - 23		35
MSB32 - 27		50
MSB32 - 32		50

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### ACCESSORIES

The MS32 or MSB32 motor protective circuit breaker with all accessories can be built in an enclosure or under a frame and a front plate



**HO-41/55** - Enclosure IP41/55



**FP-41/55** - Frame IP41/55



**P-41/55** - Front plate IP41/55

### ACCESSORIES USED FOR ALL ENCLOSURES



**E** - Emergency stop push-button available also with a key-lock.



**HZ** - Padlocking feature



**M** - Push-button diaphragm

The manufacturer also supplies an enclosure, a frame and a front plate with degree of protection IP55 (HO-55, FP-55, P-55) where the diaphragm is already inserted. However, it should be removed if a padlocking feature or an emergency stop bush-button is built-in.



**NL** - Neutral link

One N/PE neutral link is already mounted in the enclosures HO-41/55 or frames FP-41/55. A place for an additional neutral link is also provided.



**SS** - Signal lamp (B-white, R-red, Z-green)

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AUXILIARY SWITCH FOR SIDE MOUNTING HS, AUXILIARY CONTACT BLOCK HSV, TRIP INDICATING CONTACT BLOCK HRS



### HS - Auxiliary switch

HS 11 - with 1 make and 1 break contact  
 HS 10 - with 1 make contact  
 HS 20 - with 2 make contacts

Rated insulation voltage	$U_i$	V	500
Thermal current	$I_{th}$	A	5
Electrical rating acc. to IEC/EN 60947-5-1			
B300	AC-15	$U_e$	V 240
		$I_e$	A 1,5
R300	DC-13	$U_e$	V 250
		$I_e$	A 0,1
Terminal capacity	S	mm <sup>2</sup>	0,75 ... 2,5
Tightening torque		Nm	1



### HSV - Auxiliary contact block\* HRS - Trip indicating contact block\*\*

HSV 10 - with 1 make contact  
 HSV 01 - with 1 break contact  
 HRS 10 - with 1 make contact  
 HRS 01 - with 1 break contact

Rated insulation voltage	$U_i$	V	300
Thermal current	$I_{th}$	A	1
Electrical rating acc. to IEC/EN 60947-5-1			
B300	AC-15	$U_e$	V 240
		$I_e$	A 1,5
R300	DC-13	$U_e$	V 125
		$I_e$	A 0,22
Terminal capacity	S	mm <sup>2</sup>	0,75 ... 2,5
Tightening torque		Nm	1



### PP - Sealing plate

\* HSV contact remains in its normal position when MS32 / MS18 is in OFF or trip position

\*\* HRS contact changes state from its normal position when MS32 / MS18 trip due to overload, short-circuit or manual depression of the TEST lever

UNDER-VOLTAGE RELEASE UR AND SHUNT RELEASE AR



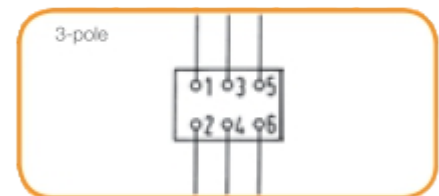
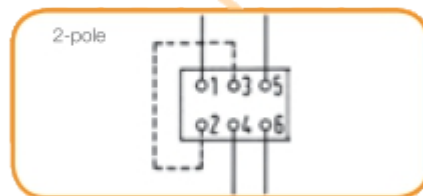
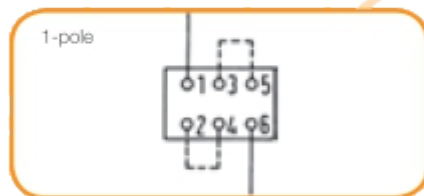
### UR - Under-voltage release AR - Shunt release

Control voltages	$U_c$	V	24 ... 600
Rated frequency	$f$	Hz	50 or 60
Terminal capacity	S	mm <sup>2</sup>	0.75 ... 2.5
Tightening torque		Nm	1

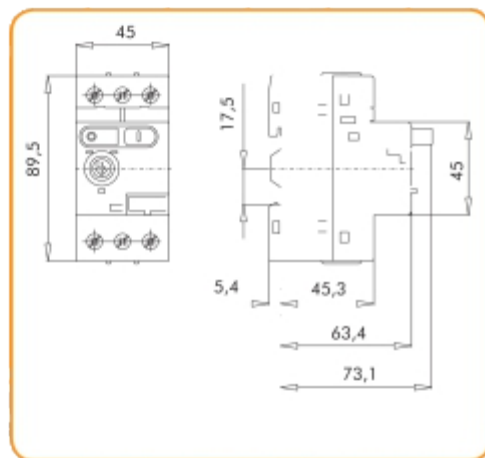
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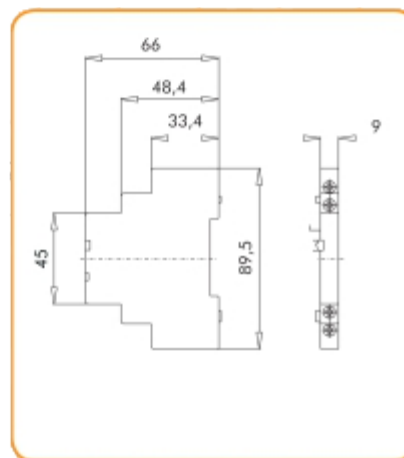
### CONNECTION DIAGRAM



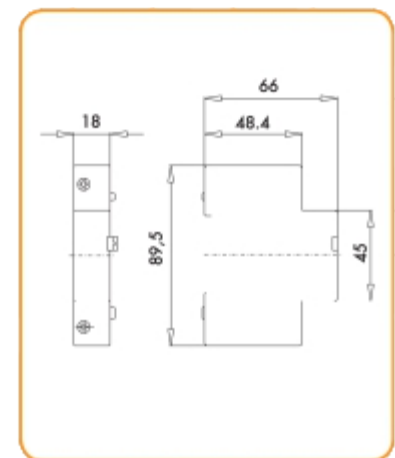
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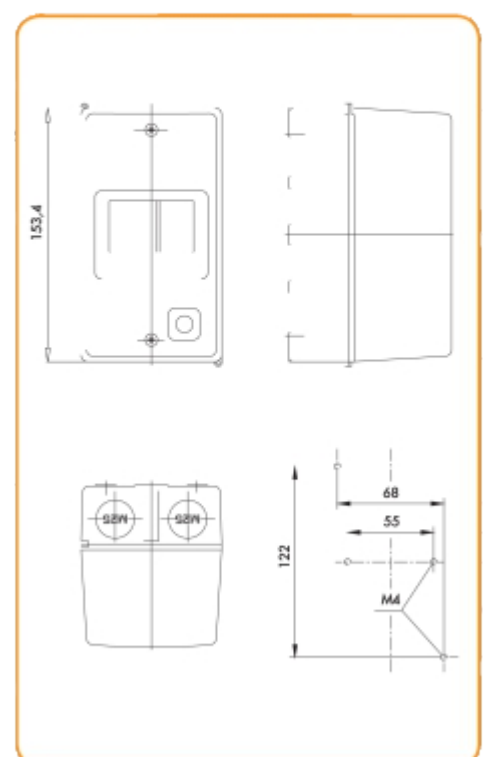
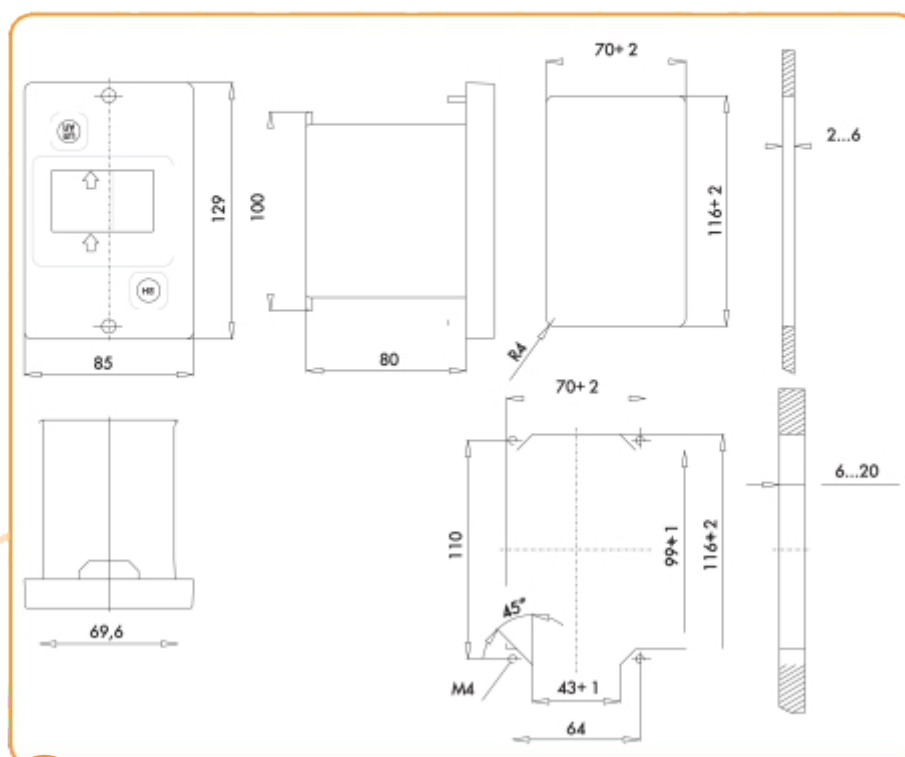
MS32 / MS18, MSB31 / MSB18  
Motor protection switch



Auxiliary switch HS



Under-voltage release UR  
Shunt release AR

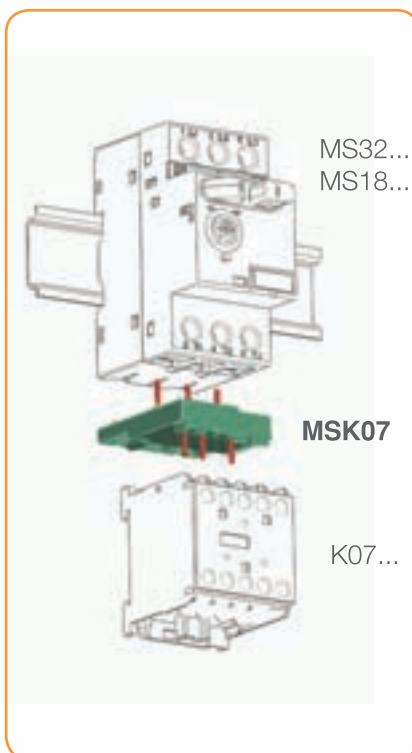


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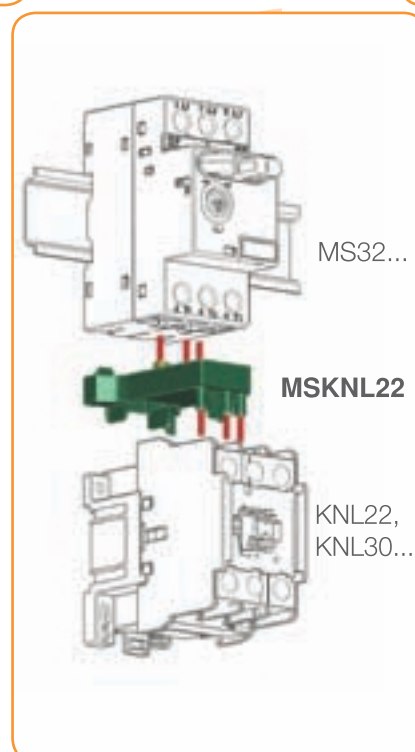
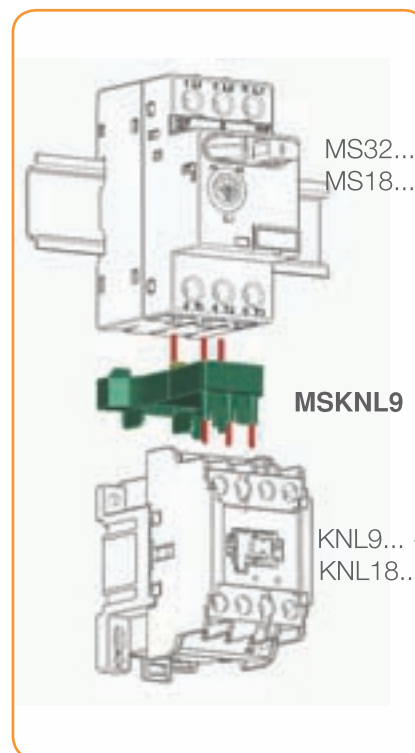
## CONNECTION BLOCKS

MSK07, MSKNL9 and MSKNL22 adapters are used for connecting a motor protection switch with a contactor forming a single-unit starter for quick assembly to a 35 mm wide mounting rail (EN 60715).

Adapter for connecting MS32 / MS18 motor protection switch with K07 mini contactor



Adapter for connecting MS32 / MS18 motor protection switch with KNL9-KNL18 contactor



Adapter for connecting MS32 motor protection switch with KNL22, KNL30 contactor