



# Manual Motor Protector

Manual Motor Protector are used for start-up and protection of electric motors (industry, small machines, external use, agricultural machines, compressors, repair shops, etc.).





Type MS32 Manual Motor Protector have been certified to comply with UL-508 and listed as Type E Manual Self-Protected Combination Motor Controllers. The MS32 is also approved for group installation under UL-508 Type E.

**For motor protection:**

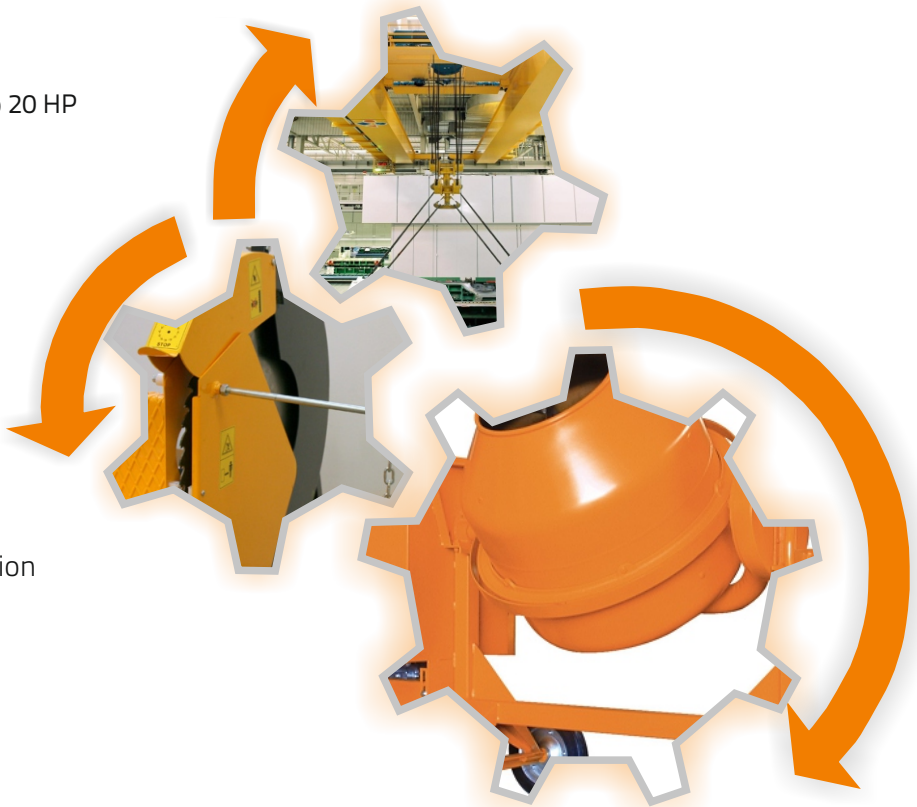
- Various AC induction motors
- For single and three-phase motors up to 20 HP

**Short-circuit and phase failure**

- Suitable for motor disconnect
- Suitable for group installation
- Suitable for design E motors

**Other benefits:**

- Wide range accessories
- Mounting on 35 mm rail
- Horizontal or vertical operating position
- Self-protected up to 25 kA



Manual Motors Protector MS32 up to 32 A .....page 2  
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# Manual Motor Protector MS32



## Manual Motor Protector areas of use

Type	Motor protection	Overload protection	Short-circuit protection	Single-phase consumers
MS32	■	■	■	■

## Manual Motor Protector MS32

with overload and short-circuit release

AC-3 acc. to IEC/EN 60947-4-1

Type E self-protected Combination Motor Protector acc. to UL508

Type	Setting range (A)	Motor power (3-phase, 240 V) (HP)	Motor power (3-phase, 460 V) (HP)	Ordering No.	Weight (g/lbs)	Packaging (pcs)
MS32-0.16	0.1 ... 0.16			30.108.757	279/0.615	1
MS32-0.25	0.16 ... 0.25			30.108.758	279/0.615	1
MS32-0.4	0.25 ... 0.4			30.108.759	279/0.615	1
MS32-0.63	0.4 ... 0.63			30.108.760	279/0.615	1
MS32-1	0.63 ... 1			30.108.761	279/0.615	1
MS32-1.6	1 ... 1.6		3/4	30.108.762	279/0.615	1
MS32-2.5	1.6 ... 2.5	1/2	1	30.108.763	279/0.615	1
MS32-4	2.5 ... 4	3/4	2	30.108.764	279/0.615	1
MS32-6.3	4 ... 6.3	1-1/2	3	30.108.765	279/0.615	1
MS32-10	6.3 ... 10	3	5	30.108.766	279/0.615	1
MS32-14	9 ... 14	3	7 - 1/2	30.108.767	279/0.615	1
MS32-18	13 ... 18	5	10	30.108.768	279/0.615	1
MS32-23	17 ... 23	5	10	30.108.769	279/0.615	1
MS32-27	23 ... 27	7 - 1/2	15	30.108.770	279/0.615	1
MS32-32	25 ... 32	10	20	30.108.771	279/0.615	1



## Ordering data





### Example:

The same switch with under-voltage release for control voltage 110 V with an auxiliary switch with two NO contacts, built in the enclosure, with an emergency stop push-button and green signal lamp for 230 V:

MS32 - 4 / UR 110/60 / HS 20 / HO41 / NAT / SSz 230

## Auxiliary contact block HSV

D300/R300 Standard Duty



Type	Number of contacts		Wiring diagram	Ordering No.	Weight (g/lbs)	Packaging (pcs)
	NO	NC				
HSV10	1	0		38.902.521	32/0.070	1
HSV01	0	1		38.902.520	32/0.070	1



- HSV contact changes position from its normal state when the MS32 is switched on.

## Trip-indicating contact block HRS

D300/R300 Standard Duty




Type	Number of contacts		Wiring diagram	Ordering No.	Weight (g/lbs)	Packaging (pcs)
	NO	NC				
HRS10	1	0		38.902.523	32/0.070	1
HRS01	0	1		38.902.522	32/0.070	1



- HRS contact changes position from its normal state when the MS32 trips due to overload, short-circuit or manual depression of the TEST lever.

## Auxiliary contact block for lateral mounting HS

D300/R300 Standard Duty

Type	Number of contacts		Wiring diagram	Ordering No.	Weight (g/lbs)	Packaging (pcs)
	NO	NC				
HS10	1	0		38.902.456	32/0.070	1
HS11	1	1		38.902.458	32/0.070	1
HS20	2	0		38.902.460	32/0.070	1



## Adapters for connection of MS32/MS18 with a contactor

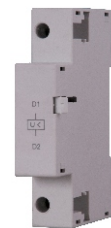
Type	Used for	Ordering No.	Weight (g/lbs)	Packaging (pcs)
MSK07	K07	30.018.211	10/0.022	10
MSKNL9	KNL9 ... KNL18	30.018.212	10/0.022	10
MSKNL22	KNL22 ... KNL30	30.018.213	10/0.022	10



# Manual Motor Protector Accessories - MS32

## Under-voltage release UR

Voltage (V)*	Frequency (Hz)	Ordering No.	Weight (g/lbs)	Packaging (pcs)
24	60	38.902.535	62/0.136	1
120	60	38.903.087	62/0.136	1
230	60	38.902.943	62/0.136	1
460	60	38.903.088	62/0.136	1
575	60	38.903.089	62/0.136	1



## Shunt release AR

Voltage (V)*	Frequency (Hz)	Ordering No.	Weight (g/lbs)	Packaging (pcs)
24	60	38.902.575	62/0.136	1
120	60	38.903.090	62/0.136	1
230	60	38.902.942	62/0.136	1
460	60	38.903.091	62/0.136	1
575	60	38.903.092	62/0.136	1



\* UR and AR releases for other control voltage/frequencies are on request.

## Enclosures for MS32

Type	Degree of protection acc. to IEC 60529 / NEMA	Ordering No.	Weight (g/lbs)	Packaging (pcs)
Enclosure HO-41	IP41/Type 1	38.423.019	222/0.489	1
Enclosure HO-55	IP55/Type 12	38.423.020	222/0.489	1
Frame FP-41	IP41/Type 1	38.423.111	158/0.348	1
Frame FP-55	IP55/Type 12	38.423.112	158/0.348	1
Front plate P-41	IP41/Type 1	37.425.102	200/0.441	1
Front plate P-55	IP55/Type 12	38.423.137	200/0.441	1



P-41/55



FP-41/55



HO-41/55

Accessories for enclosures HO-41/55, FP-41/55, P-41/55

Type	Voltage	Ordering No.	Weight (g/lbs)	Packaging (pcs)
Emergency stop push-button <b>E</b>	/	38.902.528	40/0.088	1
Emergency stop push-button with keylock <b>E-K</b>	/	38.902.530	40/0.088	1
Padlocking feature <b>HZ</b>	/	38.423.095	95/0.209	1
Push-button diaphragm IP55	/	38.423.113	12/0.026	1
Neutral link <b>NL</b>	/	38.552.076	525/1.157	25
Signal lamp <b>SSr</b> (Red)	250 V 400 V	623.000.131 623.009.261	175/0.385	25
Signal lamp <b>SSz</b> (Green)	250 V 400 V	623.009.257 623.009.262	175/0.385	25
Signal lamp <b>SSb</b> (Transparent)	250 V 400 V	623.009.256 623.009.263	175/0.385	25
Cable inlet <b>M25 x 1.5</b>	/	315.609.520	15/0.033	100



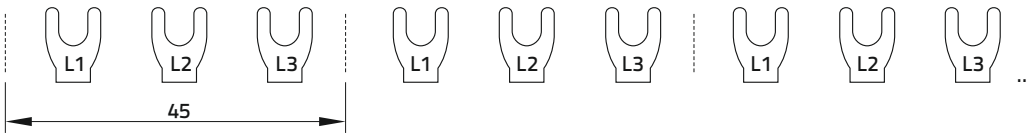
# Manual Motor Protector Accessories

## Connection blocks MSS-3L

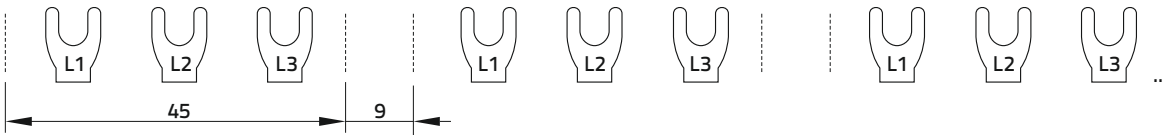
Type	Number of MPCB	Length (mm)	Ordering No.	Weight (g/lbs)	Packaging (pcs)
MSS-3L-M2-45	2	80	665.200.001	26/0.057	10
MSS-3L-M3-45	3	125	665.200.002	48/0.106	10
MSS-3L-M4-45	4	170	665.200.003	68/0.149	10
MSS-3L-M5-45	5	215	665.200.004	90/0.198	10
MSS-3L-M2 + Hi-45 + 9	2	90	665.200.005	30/0.066	10
MSS-3L-M3 + Hi-45 + 9	3	145	665.200.006	54/0.119	10
MSS-3L-M4 + Hi-45 + 9	4	200	665.200.007	78/0.172	10
MSS-3L-M5 + Hi-45 + 9	5	250	665.200.008	111/0.245	10



## MSS-3L-Mx-45 connection blocks

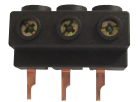


## MSS-3L-Mx-45 + 9 connection blocks (for MPCB with side-mounted accessories)



## Supply block (25 mm<sup>2</sup>)

Type	Ordering No.	Weight (g/lbs)	Packaging (pcs)
ESB-S/V-MS	665.200.009	40/0.088	10



## Protection for connection cable

Type	Ordering No.	Weight (g/lbs)	Packaging (pcs)
BS-MS 0	665.200.010	2/0.004	10







# Technical characteristics

## Dimensions





# Manual Motor Protector MS32



## TECHNICAL DATA

		Symbol	Unit	MS32
GENERAL	Type			MS32
	Use			motor protection
	Standards			IEC/EN 60947-2, IEC/EN 60947-4-1, UL508 IEC/EN 60204, UL 60947-4-1 C22.2 No. 60947-4-1A-07
	Approvals			CE, 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
	Mounting			35 mm DIN rail (EN 60715)
	Mounting position			any
	Ambient temperature		°C/°F	-25 ... +60/ -13 ... 140
	Storage temperature		°C/°F	-25 ... +70/ -13 ... 158
	Temperature range of thermal compensation		°C/°F	-5 ... +40/ 23 ... 104
	Maximum altitude (MSL) *		m/ft	2000/6560
	Mechanical endurance		op. c.	100,000
	Electrical endurance		op. c.	100,000 (AC-3), 20,000 (DC-5)
	Trip class acc. to IEC 60947-4-1			10
	Utilization category acc. to IEC 60947-4-1			AC-3
	Utilization category acc. to IEC 60947-2			A
	Max. switching frequency		op. c./h	25
	Shock resistance acc. to IEC 68-2-27		g	20
	Vibration resistance acc. to IEC 68-2-6		g	5 (at f= 5 ... 150 Hz)
Overvoltage category			III	
Pollution degree			3	
Rated insulation voltage		$U_i$	V	600
Rated impulse withstand voltage		$U_{imp}$	kV	6
Weight			g/lbs	279/0.615
MAIN CIRCUIT	Terminal capacity:			
	rigid	S	mm <sup>2</sup> / AWG	1 ... 10 / 14 ... 8
	flexible			1 ... 6 / 14 ... 10
	flexible with end sleeve			0.75 ... 6 / 18 ... 10
	Conductor insulation stripping length		mm/in	10 / 0.393
	Screw			M3
	Screw type			PZ2, with self-lifting clamp protected from falling out
	Tightening torque		Nm/lb.in.	2.0 / 18
	Nominal current	$I_n$	A	0.16, 0.25, 0.4, 0.63, 1, 1.6, 2.5, 6.3, 10, 14, 18, 23, 27, 32
	Current setting	$I_T$	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, 2.4-4, 4-6.3 6.3-10, 9-14, 13-18, 17-23, 20-27, 25-32
	Nominal current range	$I_n$	A	0.16 ... 32
	Nominal frequency	f	Hz	50/60
	Max. operational voltage	$U_e$	V	600 (up to MS32-27); 480 (MS32-32)
	Thermal current	$I_{th}$	A	32
	Max. motor FLA		A	32
	Number of all poles			3
	Number of protected poles			3
	Contact gap (per pole)		mm/in	9.2 / 0.362
	Release type			thermal-magnetic
	Operating current of thermal overload release			$1.05 I_n < I \leq 1.2 I_n$
Operating current of magnetic release (fixed)			$12 I_n \pm 20\%$	
Sensitivity to phase failure			yes	
Power dissipation at $I_n$ (all poles)		W	6 ... 7.5	
SAFETY	MTTF - Mean time to failure		h	1666
	$MTTF = 1/\lambda = B10/(0.1 n_{op})$			
	MTTF <sub>d</sub> - Mean time to failure dangerous		h	5000
	$MTTF_d = 1/\lambda_d = B10_d/(0.1 n_{op})$			
	B10 - Number of operating cycles until 10 % of devices fail		op.	20.000
	B10 <sub>d</sub> - Number of operating cycles until 10 % of device dangerous		op.	60.000
	$B10_d = B10/\text{ratio of dangerous failures}$			
	$\lambda$ - Failure rate		1/h	$6 \times 10^{-4}$
	$\lambda = (0,1 n_{op})/B10$			
	$\lambda_d$ - Failure rate dangerous		1/h	$2 \times 10^{-4}$
$\lambda_d = (0,1 n_{op})/B10_d$				
Ratio of dangerous failures		%	33	
$n_{op}$ - Operating cycles (operating cycles/h)		op./h	120	

\* NOTE: Above 2000 m/ 6560 ft voltages  $U_i$  and  $U_e$  are reduced by 2% for every 100 m/ 350 ft and current  $I_n$  by 2% for every 500 m/ 1640 ft.

## Switch selection for motor protection

Standard motor powers						Setting range
Single-phase		Three-phase				
120 V	220 V 230 V 240 V	220 V 230 V 240 V	380 V 400 V 415 V	440 - 480 V	550 - 600 V	A
HP						
						0.1 ... 0.16
						0.16 ... 0.25
						0.25 ... 0.4
						0.4 ... 0.63
					1/2	0.63 ... 1
	1/10		1/2	3/4	3/4	1 ... 1.6
	1/6	1/2	1	1	1.5	1.6 ... 2.5
1/8	1/3	3/4	1-1/2	2	3	2.5 ... 4
1/4	1/2	1.5	3	3	5	4 ... 6.3
1/2	1	3	5	5	7-1/2	6.3 ... 10
1/2	2	3	5	7-1/2	10	9 ... 14
1	3	5	7.5	10	10	13 ... 18
1-1/2	3	5	10	10	15	17 ... 23
2	3	7-1/2	10	15	20	20 ... 27
2	5	10	15	20		25 ... 32

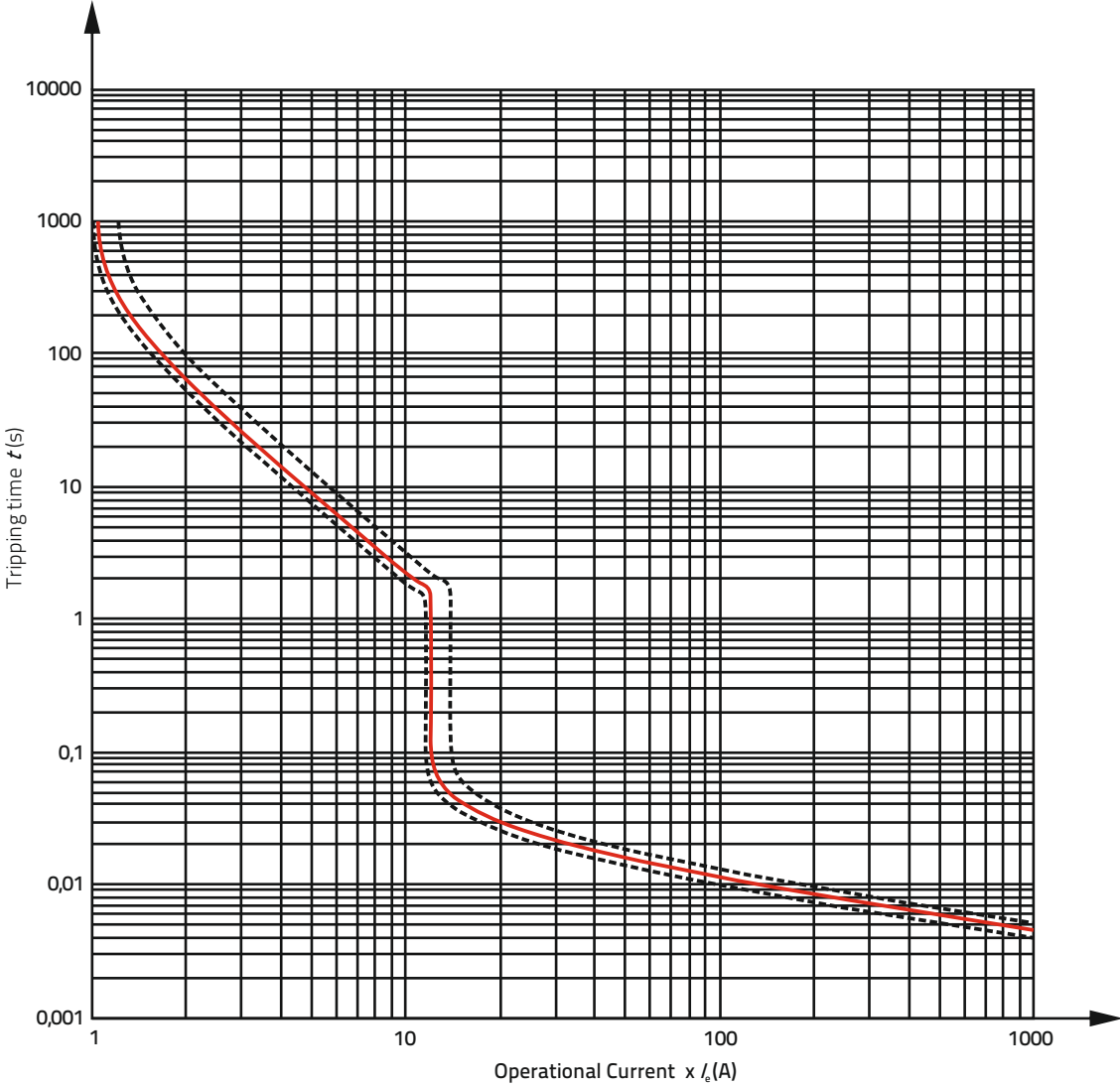
Ms32 Manual Motor Protector, rated ultimate and service short-circuit breaking capacity  $I_{cu}$  and  $I_{cs}$  and max. back-up fuses if short circuit current  $I_{cp}$  exceeds  $I_{cu}$

Type	Operating current of short-circuit release (A)	Max. short-circuit current (A)	Max. fuse OTS (A)
MS32 - 0.16	2	25 kA at 600 V	35
MS32 - 0.25	3		35
MS32 - 0.4	5		35
MS32 - 0.63	8		35
MS32 - 1	12		35
MS32 - 1.6	20		35
MS32 - 2.5	33		40
MS32 - 4	44		40
MS32 - 6.3	75		50
MS32 - 10	120		50
MS32 - 14	160	10 kA at 600 V	60
MS32 - 18	230		70
MS32 - 23	270		80
MS32 - 27	360		80
MS32 - 32	400		10 kA at 500 V

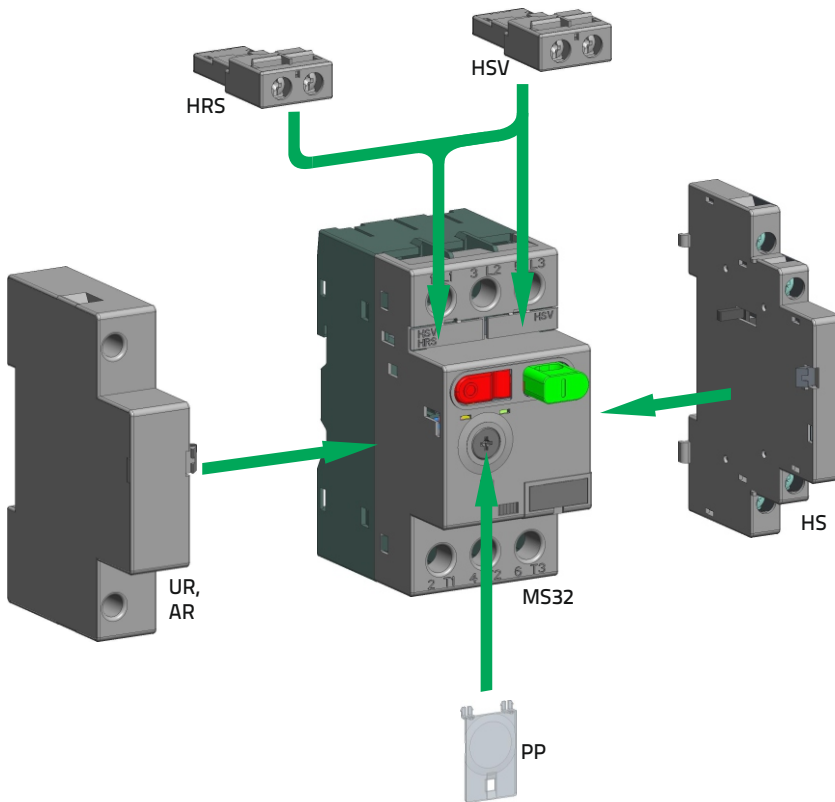
# Manual Motor Protector MS32



## Tripping characteristics



Mounting positions of accessories



# Manual Motor Protector MS32 - Accessories



## Auxiliary switch for side mounting HS

### TECHNICAL DATA

Standards			UL 60947-5-1
Approvals			CE, UL, EAC
Rated impulse voltage	$U_{imp}$	V	6 kV
Rated insulation voltage	$U_i$	V	500
Thermal current	$I_{th}$	A	5
Rated operational current (240 V) B300	$I_e$	A	1.5
Rated operational current (250 V) R300	$I_e$	A	0.1
Contact rating code designation for AC/DC			B300 / R300
Mechanical endurance		op. c.	100,000
Terminal capacity	S	mm <sup>2</sup> /AWG	0.75 ... 2.5 / 18 ... 14
Conductor insulation stripping length		mm/in	8 / 0.315
Screw type			M3.5
Screw head			PZ1
Tightening torque		Nm/lb.in	1 / 8.9

## Auxiliary contact block HSV, Trip indicating contact block HRS

### TECHNICAL DATA

Standards			UL 60947-5-1
Approvals			CE, UL, EAC
Rated impulse voltage	$U_{imp}$	V	6
Rated insulation voltage	$U_i$	V	300
Thermal current	$I_{th}$	A	1
Rated operational current (240 V) B300	$I_e$	A	3
Rated operational current (125 V) R300	$I_e$	A	0.22
Contact rating code designation for AC/DC			B300 / R300
Mechanical endurance		op. c.	100,000
Terminal capacity	S	mm <sup>2</sup> /AWG	0.75 ... 2.5 / 18 ... 14
Conductor insulation stripping length		mm/in	8 / 0.315
Screw type			M3.5
Screw head			PZ1
Tightening torque		Nm/lb.in	0.6 / 5.3

## Under-voltage release UR, Shunt release AR

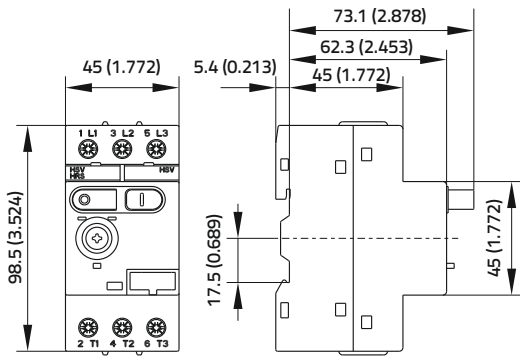
### TECHNICAL DATA

Type			UR	AR
Standards			UL 60947-1	
Approvals			CE, UL, EAC	
Control voltages (AC)	$U_c$	V	24, 120, 230, 460, 575	
Rated frequency	f	Hz	60	
Pick-up voltage x $U_c$		%	< 0.85	≤ 0.7
Drop-up voltage x $U_c$		%	0.7 ... 0.35	0.7 ... 0.15
Power consumption switch-on operation		VA/W	7.9 / 3.9	
switch-on operation			3.3 / 0.9	
Duty cycle	$t_{ON}/t_{OFF}$	%	100	
Noise level		dB	≤ 35	
Mechanical and electrical endurance		op.	min. 10.000	
Terminal capacity		mm <sup>2</sup> /AWG	0.75 ... 2.5 / 18 ... 14	
Conductor insulation stripping length		mm/in	11 / 0.433	
Screw type			M3.5	
Screw head			PZ2	
Tightening torque		Nm/lb.in	1 / 8.9	

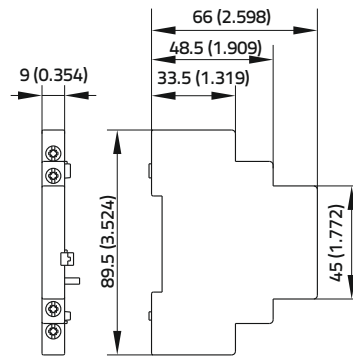
# Manual Motor Protector Dimensions

Dimension - mm (in)

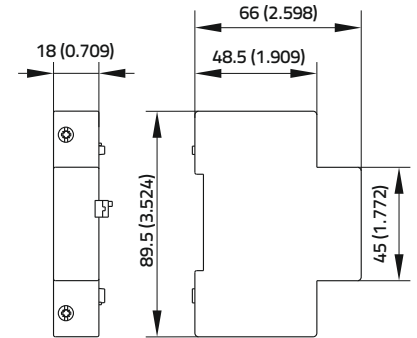
MS32



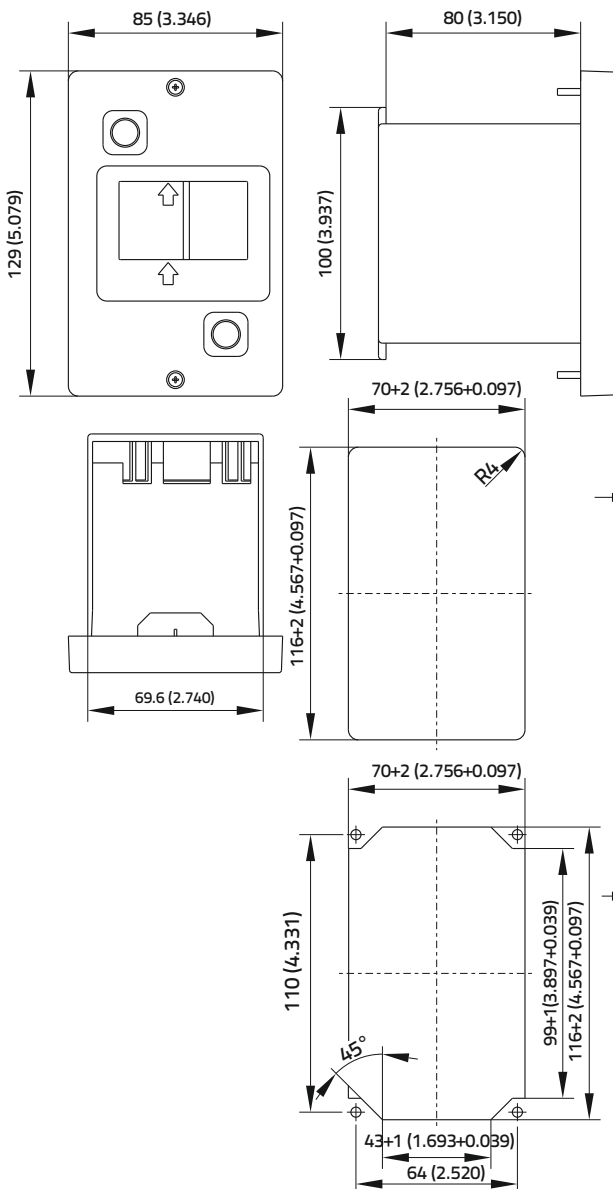
Auxiliary switch HS



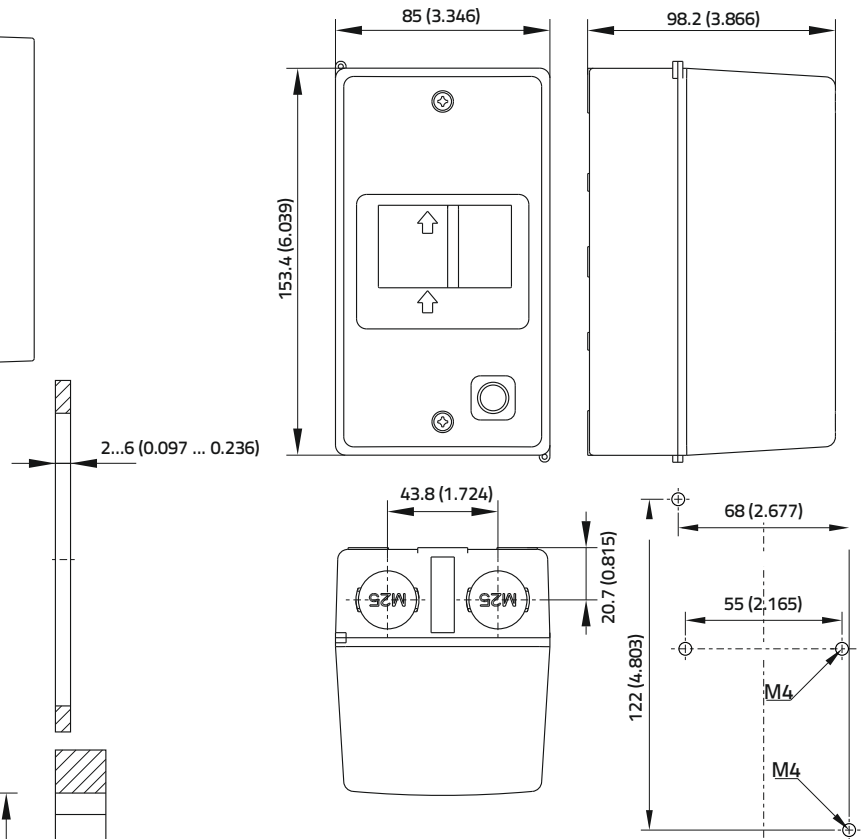
Under-voltage release UR  
Shunt release AR



FP-41/55



HO-41/55





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