Moulded case circuit breakers

- Three-pole, IEC standard
- Four-pole, IEC standard
- Three-pole, UL489 standard
- Electronic trip unit
- Test button
- Trip indication on front
- Alarm LED on front
- Wide range of accessories.

Page 13-4

THREE-POLE, IEC STANDARD

- From 100A to 800A
- Electronic trip unit
- Breaking capacity Icu at 400V: from 50kA to 65kA
- Wide range of adjustable tripping current
- Short circuit tripping delay is selectable.

Page 13-4

FOUR-POLE, IEC STANDARD

- From 100A to 800A
- Electronic trip unit
- Breaking capacity Icu at 400V: from 50kA to 65kA
- Wide range of adjustable tripping current
- 4th pole on the left side
- Adjustable 4th pole protection
- Short circuit tripping delay is selectable.

Page 13-4

THREE-POLE, UL489 STANDARD

- From 100A to 600A
- Electronic trip unit
- Breaking capacity Icu at 480V: 65kA
- Wide range of adjustable tripping current
- Short circuit tripping delay.

IEC/EN/BS 60947-2 version								
	3-pole	**P5ME3PS0100**	**P5ME3PS0160**	**P5ME3PS0250**	**P5ME3PS0400**	**P5ME3PS0630**	**P5ME3PS0800**
	4-pole	**P5ME4PS0100**	**P5ME4PS0160**	**P5ME4PS0250**	**P5ME4PS0400**	**P5ME4PS0630**	**P5ME4PS0800**
Rated current (≤40°C)	A	100	160	250	400	630	800
Electronic overload trip adjustment range	A	40...100	64...160	100...250	160...400	252...630	320...800
Electronic short circuit trip adjustment range	A	60...1000	96...1600	150...2500	240...4000	378...6300	480...8000
AC rated operational voltage Ue	V	690	690	690	690	690	690
Rated insulation voltage Ui	V	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage Uimp	kV	8	8	8	8	8	8
Short circuit breaking capacity Icu							
220...240VAC 50/60Hz	kA	100	100	100	100	100	100
380...415VAC 50/60Hz	kA	50	50	50	65	65	65
440...460VAC 50/60Hz	kA	50	50	50	65	65	65
480...500VAC 50/60Hz	kA	42	42	42	42	42	42
525VAC 50/60Hz	kA	22	22	22	22	22	22
660...690VAC 50/60Hz	kA	10	10	10	10	10	10
Short circuit breaking capacity Ics							
220...240VAC 50/60Hz	kA	100	100	100	100	100	100
380...415VAC 50/60Hz	kA	50	50	50	65	65	65
440...460VAC 50/60Hz	kA	50	50	50	65	65	65
480...500VAC 50/60Hz	kA	42	42	42	42	42	42
525VAC 50/60Hz	kA	22	22	22	22	22	22
660...690VAC 50/60Hz	kA	5	5	5	10	10	10
Heat dissipation per pole (max)	W	9.6	16	16	48	83	76
Resistance per pole	mΩ	0.96	0.62	0.25	0.3	0.21	0.12
AMBIENT CONDITIONS							
Operating temperature	°C	-20...+70					
Storage temperature	°C	-40...+80					
Current derating for temperature > 40°C 50°C	A	94	150	234	375	591	750
60°C	A	88	141	220	353	555	705
70°C	A	82	131	205	328	517	656
Operating position Normal		On vertical plane					
Allowable		Any					
Fixing		Screw					
LIFE							
Mechanical	cycles	25,000			20,000	20,000	10,000
Electrical (Ie at 400V)	cycles	10,000			10,000	6,000	3,000
DIMENSIONS							
3P (WxHxD)	mm	105x160x86			140x260x110		210x320x135
4P (WxHxD)	mm	140x160x86			186x260x110		280x320x135

UL489 version			P5ME3PH0100UL	P5ME3PH0250UL	P5ME3PH0400UL	P5ME3PH0600UL
		3-pole				
Rated current		A	100	250	400	600
Electronic overload trip adjustment range		A	40...100	80...250	150...400	225...600
Electronic short circuit trip adjustment range		A	60...1100	120...2750	225...4400	338...6600
AC rated operational voltage Ue		V	600	600	600	600
Rated insulation voltage Ui		V	750	750	750	750
Rated impulse withstand voltage Uimp		kV	8	8	8	8
UL489 short circuit breaking capacity						
240VAC 50/60Hz		kA	100	100	100	100
480VAC 50/60Hz		kA	65	65	65	65
600VAC 50/60Hz		kA	35	35	35	35
IEC60947-2 Icu short circuit breaking capacity						
220...240VAC 50/60Hz		kA	100	100	100	100
380...415VAC 50/60Hz		kA	65	65	65	65
480...500VAC 50/60Hz		kA	35	35	35	35
Heat dissipation per pole (max)		W	9.6	16	48	83
Resistance per pole		mΩ	0.96	0.25	0.3	0.21
AMBIENT CONDITIONS						
Operating temperature		°C	-20...+70			
Storage temperature		°C	-40...+80			
Current derating for temperature > 40°C	50°C	A	94	234	375	591
	60°C	A	88	220	353	555
	70°C	A	82	205	328	517
Operating position	Normal		On vertical plane			
	Allowable		Any			
Fixing			Screw			
LIFE						
Mechanical		cycles	25,000	25,000	20,000	20,000
Electrical (Ie at 400V)		cycles	10,000	10,000	10,000	6,000
DIMENSIONS						
3P (WxHxD)			105x165x87	105x190x87	140x290x110	140x340x110

Electronic short circuit and overload protection IEC standard

P5ME3PS0100

new

Order code	Overload trip adjustment range	Short circuit trip adjustment range	Short circuit breaking capacity at 400V Icu	Ics	Qty per pkg	Wt
	[A]	[A]	[kA]	[kA]	n°	[kg]
Three-pole, IEC standard.						
P5ME3PS0100	40...100	60...1000	50	50	1	2.000
P5ME3PS0160	64...160	96...1600	50	50	1	2.000
P5ME3PS0250	100...250	150...2500	50	50	1	2.000
P5ME3PS0400	160...400	240...4000	65	65	1	5.400
P5ME3PS0630	252...630	378...6300	65	65	1	5.400
P5ME3PS0800	320...800	480...8000	65	65	1	15.100

P5ME4PS0100

new

Order code	Overload trip adjustment range	Short circuit trip adjustment range	Short circuit breaking capacity at 400V Icu	Ics	Qty per pkg	Wt
	[A]	[A]	[kA]	[kA]	n°	[kg]
Four-pole, IEC standard. Fourth pole on the left side.						
P5ME4PS0100	40...100	60...1000	50	50	1	2.600
P5ME4PS0160	64...160	96...1600	50	50	1	2.600
P5ME4PS0250	100...250	150...2500	50	50	1	2.600
P5ME4PS0400	160...400	240...4000	65	65	1	7.200
P5ME4PS0630	252...630	378...6300	65	65	1	7.200
P5ME4PS0800	320...800	480...8000	65	65	1	19.600

Electronic short circuit and overload protection UL489 standard

P5ME3PS0100

new

Order code	Overload trip adjustment range	Short circuit trip adjustment range	Short circuit breaking capacity at 480V	Qty per pkg	Wt
	[A]	[A]	[kA]	n°	[kg]
Three-pole, UL489 standard.					
P5ME3PH0100UL	40...100	60...1100	65	1	1.790
P5ME3PH0250UL	80...250	120...2750	65	1	2.040
P5ME3PH0400UL	150...400	225...4400	65	1	6.300
P5ME3PH0600UL	225...600	338...6600	65	1	7.160

General characteristics

Lovato Electric MOULDED CASE CIRCUIT BREAKERS (MCCBs) are technologically advanced devices with electronic trip units. These breakers offer a wide current adjustment range, ensuring high precision in tripping and providing the flexibility to set a short tripping delay in the event of a short circuit. The incorporation of a modern and efficient contact operating system joined with high-performance arc chambers improves the reliability and functionality of these circuit breakers. This comprehensive range includes MCCBs compliant with either IEC or UL standards.
The operating lever is equipped with a trip position, serving as an indicator for openings resulting from faults in the plant. A useful test button facilitates the verification of the plant's signalling system. Additionally, a LED on the MCCB's front signals a high current level that may cause the breaker to trip. In the four pole version, a dedicated adjuster allows for the specific setting of tripping current on the 4th pole, which can differ from the three main poles.
Moreover, Lovato Electric MCCBs distinguish themselves by offering a wide range of accessories, making them the ideal choice for constructing modern and efficient systems.
All the MCCB are supplied with a kit of fixing screws and, for IEC versions, also with phase barriers.

Operational characteristics

- IEC rated insulation voltage Ui: 1000V
- IEC rated impulse withstand voltage: 8kV
- IEC rated frequency: 50/60Hz
- IEC breaking capacity: See table on page 13-2
- Mounting position: Any
- IEC degree of protection: IP20 on front
- Storage temperature: -40°C...+80°C
- Operating temperature: -20°C...+70°C (with derating above 40°C)

Certifications and compliance

Certifications obtained: cULus for P5ME...UL versions.
Compliant with standards: IEC/EN/BS 60947-2; UL489 for P5ME…UL versions.

Add-on blocks and accessories

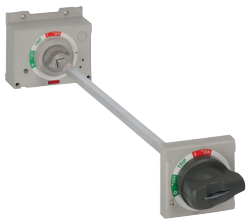
P5X1011

P5X1311

P5X14...

P5X16...

new



P5X1847...

P5X19...

Order code	Description	Qty per pkg	Wt
		n°	[kg]
Add-on auxiliary contacts.			
P5X1011❶	One changeover contact. Screw terminals.	1	0.025
Add-on auxiliary contacts for tripping indication.			
P5X1311❶	One changeover contact for overload and short circuit tripping indication and shunt trip or undervoltage release. Wired.	1	0.038
P5X1311E	One changeover contact for overload and short circuit tripping indication. Wired.	1	0.038
Undervoltage trip releases.			
P5X14E024❶	24VAC/DC	1	0.095
P5X14E048❶	48VAC/DC	1	0.095
P5X14E110❶	110...130VAC/DC	1	0.095
P5X14E230❶	220...240VAC - 250VDC	1	0.095
P5X14A400❶	380...440VAC	1	0.095
P5X14A440❶	440...480VAC	1	0.095
Shunt trip releases.			
P5X16D012❶	12VDC	1	0.095
P5X16E024❶	24VAC/DC	1	0.095
P5X16E048❶	48VAC/DC	1	0.095
P5X16E110❶	110...130VAC/DC	1	0.095
P5X16E230❶	220...240VAC - 250VDC	1	0.095
P5X16A400❶	380...500VAC	1	0.095
IP65 (UL Type 4 / 4X) red/yellow padlockable door coupling handle complete with shaft.			
P5X18471	For P5ME…0100..., P5ME...0160... and P5ME...0250...; shaft length 469mm/18.5”	1	0.750
P5X18472	For P5ME...0400... and P5ME...0630...; shaft length 469mm/18.5”	1	0.830
P5X18473	For P5ME...0800; shaft length 469mm/18.5”	1	0.940
IP65 (UL Type 4 / 4X) grey padlockable door coupling handle complete with shaft.			
P5X18471B	For P5ME...0100..., P5ME...0160... and P5ME...0250...; shaft length 469mm/18.5”	1	0.850
P5X18472B	For P5ME...0400... and P5ME...0630...; shaft length 469mm/18.5”	1	0.830
P5X18473B	For P5ME...0800; shaft length 469mm/18.5”	1	0.940
Motor operator for remote operation.			
P5X191D024	24VDC for P5ME...0100..., P5ME...0160... and P5ME...0250...	1	0.850
P5X191E110	110VAC/DC for P5ME...0100..., P5ME...0160... and P5ME...0250...	1	0.850
P5X191E230	230VAC / 220VDC for P5ME...0100..., P5ME...0160... and P5ME...0250...	1	0.850
P5X192D024	24VDC for P5ME...0400... and P5ME...0630...	1	1.130
P5X192E110	110VAC/DC for P5ME...0400... and P5ME...0630...	1	1.130
P5X192E230	230VAC / 220VDC for P5ME...0400... and P5ME...0630...	1	1.130
P5X193D024	24VDC for P5ME...0800	1	1.130
P5X193E110	110VAC/DC for P5ME...0800	1	1.130
P5X193E230	230VAC / 220VDC for P5ME...0800	1	1.130

❶ Add UL at the end of the code for accessories to be added to UL certified MCCBs.

ADD-ON AUXILIARY CONTACTS
- Snap mounting under the front cover
- Max 2 blocks for MCCBs up to 250A
- Max 3 blocks for MCCBs from 400A to 800A
- Screw connection
- Screw tightening tool: Pozidriv 2
- Conductor cross section minimum-maximum: 0.5...1.5mm² or 20...16AWG
- Tightening torque: 0.8Nm/7lb.in
- 250VAC - 3A; 250VDC 0.2A.

ADD-ON AUXILIARY CONTACTS FOR TRIPPING INDICATION
- Snap mounting under the front cover
- Max 2 blocks for MCCBs up to 250A (1x P5X1311 and 1x P5X1311E)
- Max 3 blocks for MCCBs from 400A to 800A (2x P5X1311 and 1x P5X1311E)
- Wired with 500mm (20”) long wires
- 250VAC - 3A; 250VDC 0.2A.

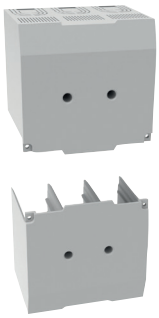
UNDERVOLTAGE TRIP RELEASES
- Snap mounting under the front cover
- Consumption AC version: ≤1.7VA
- Consumption DC version: ≤1.4W
- Release voltage: 0.35...0.7Us
- Operating voltage: 0.85...1.1Us
- Screw connection
- Screw tightening tool: Pozidriv 2
- Conductor cross section minimum-maximum: 0.5...1.5mm² or 20...16AWG
- Tightening torque: 0.8Nm/7lb.in.

SHUNT TRIP RELEASES
- Snap mounting under the front cover
- Consumption AC version: ≤1.8VA
- Consumption DC version: ≤1.9W
- Operating voltage: 0.7...1.1Us
- Screw connection
- Screw tightening tool: Pozidriv 2
- Conductor cross section minimum-maximum: 0.5...1.5mm² or 20...16AWG
- Tightening torque: 0.8Nm/7lb.in.

PADLOCKABLE DOOR COUPLING HANDLES
- IEC degree of protection: IP65
- Degree of protection according to UL: Type 1, 2, 3R, 12, 12K, 4, 4X; external use
- Padlock diameter required: 6mm (0.24”) max
- Door coupling feature defeatable per UL508A
- Front plate dimensions: 76x76mm (3”x3”).

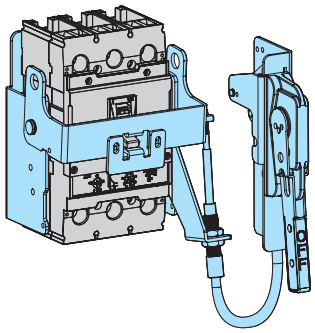
MOTOR OPERATOR
- Manual operation possible
- Front On/Off/Trip indicator
- Trip test button
- On/Off/Reset selection lever
- Man/Auto selection lever
- Operating time closing/opening
  P5X191... 350/230ms
  P5X192... 500/350ms
  P5X193... 700/420ms
- Mechanical life
  P5X191... 25.000 cycles
  P5X192... 20.000 cycles
  P5X193... 10.000 cycles
- Tightening torque: 1.2Nm/10lb.in.

Add-on blocks and accessories



P5X831L

P5X504



P5X194X...

Order code	Description	Qty per pkg	Wt
		n°	[kg]
Power terminal protections. Long version. Three-pole terminal cover.			
P5X831L	For P5ME3PS0100, P5ME3PS0160 and P5ME3PS0250	1	0.295
P5X832L	For P5ME3PS0400 and P5ME3PS0630	1	0.350
P5X833L	For P5ME3PS0800	1	0.440
Four-pole terminal covers.			
P5X841L	For P5ME4PS0100, P5ME4PS0160 and P5ME4PS0250	1	0.395
P5X842L	For P5ME4PS0400 and P5ME4PS0630	1	0.468
P5X843L	For P5ME4PS0800	1	0.585
Power terminal protections. Short version. Three-pole terminal cover.			
P5X831S	For P5ME3PS0100, P5ME3PS0160 and P5ME3PS0250	1	0.142
P5X832S	For P5ME3PS0400 and P5ME3PS0630	1	0.175
P5X833S	For P5ME3PS0800	1	0.240
Four-pole terminal covers.			
P5X841S	For P5ME4PS0100, P5ME4PS0160 and P5ME4PS0250	1	0.190
P5X842S	For P5ME4PS0400 and P5ME4PS0630	1	0.283
P5X843S	For P5ME4PS0800	1	0.320
Terminal clamp sets for rigid and flexible cables.			
P5X501	For P5ME3PH0100UL; 3-piece set	1	0.450
P5X502	For P5ME3PH0250UL; 3-piece set	1	0.660
P5X503	For P5ME3PH0400UL; 6-piece set	1	0.180
P5X504	For P5ME3PH0600UL; 6-piece set	1	0.220
Handles with cable operating mechanism.			
P5X194X1UL	Handle for P5ME3PH0100UL and P5ME3PH0250UL. Degree of protection according to UL: Type 4, 4X	1	1.230
P5X194X2UL	Handle for P5ME3PH0400UL and P5ME3PH0600UL. Degree of protection according to UL: Type 4, 4X	1	1.710
P5X19L36UL	Cable for handle P5X194X... 36 inch long (915mm)	1	0.630
P5X19L48UL	Cable for handle P5X194X... 48 inch long (1219mm)	1	0.840
P5X19L60UL	Cable for handle P5X194X... 60 inch long (1524mm)	1	1.050

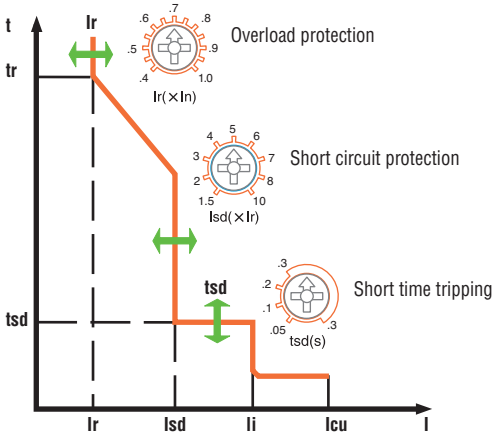
new

POWER TERMINAL PROTECTIONS
The availability of two versions, the long and short covers, ensures adaptability in protection to accommodate various types of wiring configurations.

TERMINAL CLAMP SETS
Terminal clamp sets are required for MCCBs UL certified. They are robust aluminium clamps with allen key screws.

HANDLES WITH CABLE OPERATING MECHANISM
Mounted on the panel door or structure, this device is used to operate MCCBs according with NFPA and UL508A Standards. It achieves this through the utilization of cables of various lengths, 36, 48 or 60 inches, which operate the MCCB by means a structure positioned on the front of the circuit breaker.
The handles have NEMA protection degree 4, 4X.

MCCB setting for IEC version



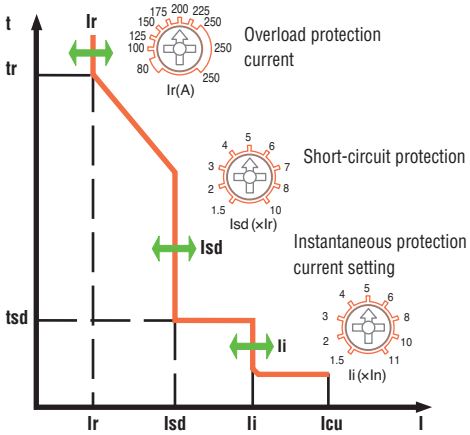
1. Overload protection Ir(xIn).
The adjuster sets the rated overload protection current of the MCCB. The value indicated in the scale must be multiplied by the rated current of the MCCB.
E.G. If we set .5 on a MCCB with a rated current of 250A the overload overload protection level will be 250x0.5=125A.

2. Short circuit protection Isd(xIr).
The adjuster sets the short circuit current tripping threshold. The value indicated on the scale must be multiplied by the overload protection current Ir(xIn).
See explanation above.
E.G. If we set 8 on the adjuster when the overload protection is set at 250A the short circuit protection threshold will be 250x8=2000A.

3. Short time tripping delay tsd(s).
The adjuster set a tripping delay in case of a short circuit which gives time for downstream protections to trip, avoiding the simultaneous opening of both the general protection and the protection of the individual section of the system ensuring continuity of service of the plant branches not involved in the failure.
The delay can be set from 0.05s to 0.3s.
NOTE: the delay is valid with a short circuit current up to Inx11.
E.g. On an MCCB rated 250A, with a current over 250x11=2750A, the tripping will be instantaneous.

4th pole settings
The 4th pole has a dedicated adjuster to select a specific protection. It can be set as: no protection, protection at 50% of In, 100% of In.

MCCB setting for UL489 version



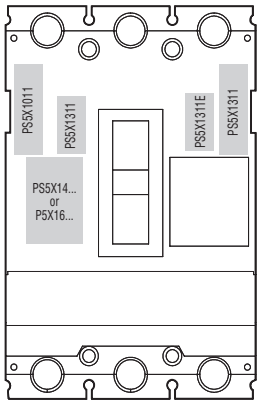
1. Overload protection Ir(A).
The adjuster sets the rated overload protection current of the MCCB. If we set 100A on an MCCB with a rated current of 250A, the overload protection threshold will be 100A.
The tripping time at 6xIr is fixed at 16s. For lower overloads, the tripping time increases up to 150s with an overload current of 2xIr.

2. Short circuit protection Isd(xIr).
The adjuster sets the short circuit current tripping threshold. The value indicated on the scale must be multiplied by the overload protection current Ir(A).
See explanation above.
E.G. If we set 8 on the adjuster when the overload protection is set at 250A the short circuit protection threshold will be 250x8=2000A.
NOTE: The MCCB has a non-adjustable tripping delay of 70ms...140ms. For instantaneous tripping see item 3.

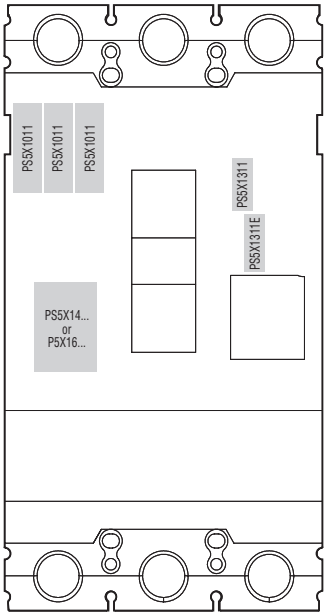
3. Instantaneous protection current setting Ii (xIn).
The adjuster sets the instantaneous tripping threshold. The value indicated on the scale must be multiplied by the rated current of the MCCB.
E.G. If we set 10 on the adjuster of an MCCB with a rated current In of 250A, the short circuit protection threshold will be 250x10=2500A.
The tripping time is less than 60ms.

Combinations for IEC version

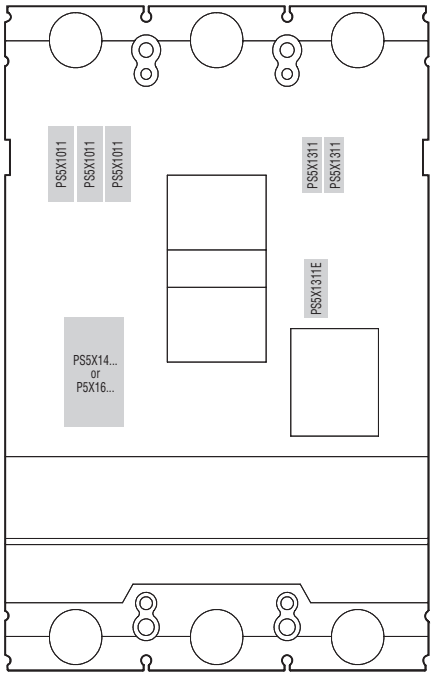
P5ME3PS0100
P5ME3PS0160
P5ME3PS0250



P5ME3PS0400
P5ME3PS0630



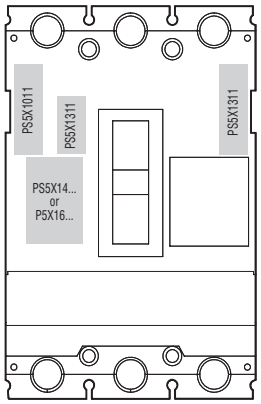
P5ME3PS0800



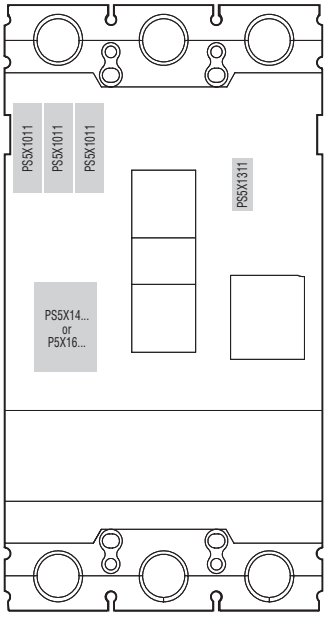
P5X1011 Auxiliary contact.
P5X1311 Auxiliary contacts for tripping indication.
P5X1311E Auxiliary contacts for tripping indication.
P5X14... Undervoltage trip releases.
P5X16... Shunt trip releases.

Combinations for UL489 version

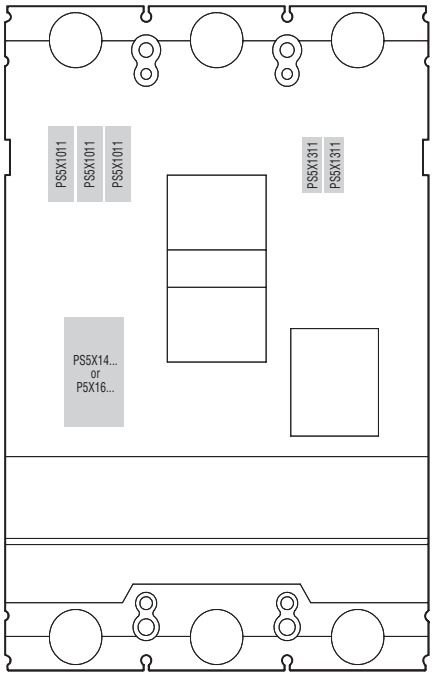
P5ME3PH0100UL
P5ME3PH0250UL



P5ME3PH0400UL

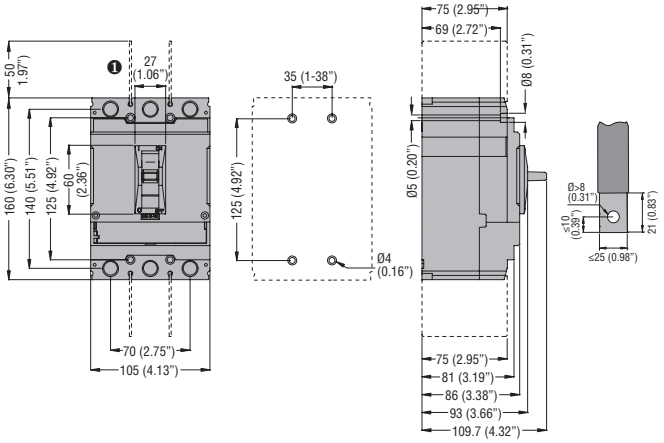


P5ME3PH0600UL

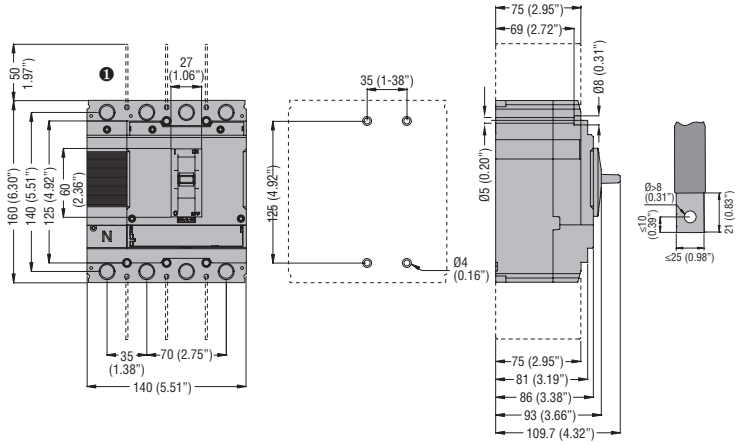


P5X1011UL Auxiliary contact.
P5X1311UL Auxiliary contacts for tripping indication.
P5X14...UL Undervoltage trip releases.
P5X16...UL Shunt trip releases.

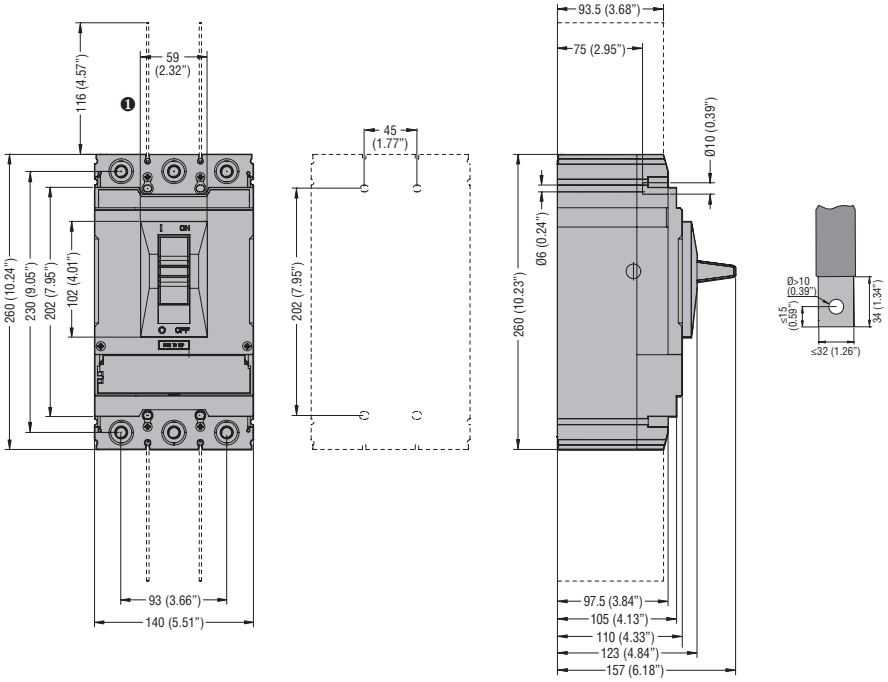
P5ME3PS0100 - P5ME3PS0160 - P5ME3PS0250



P5ME4PS0100 - P5ME4PS0160 - P5ME4PS0250



P5ME3PS0400 - P5ME3PS0630



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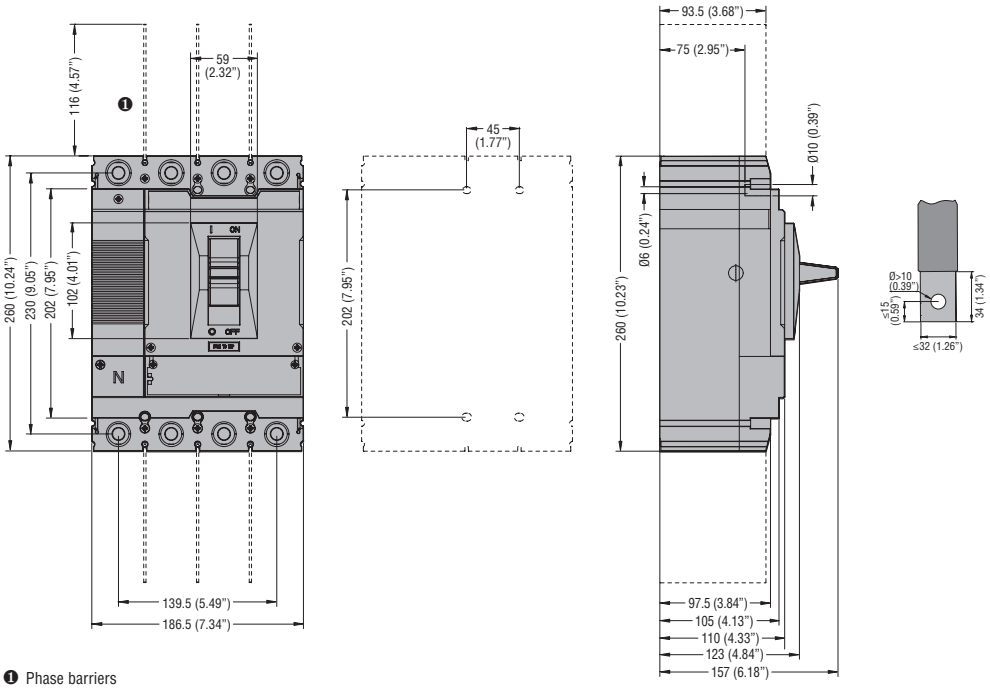
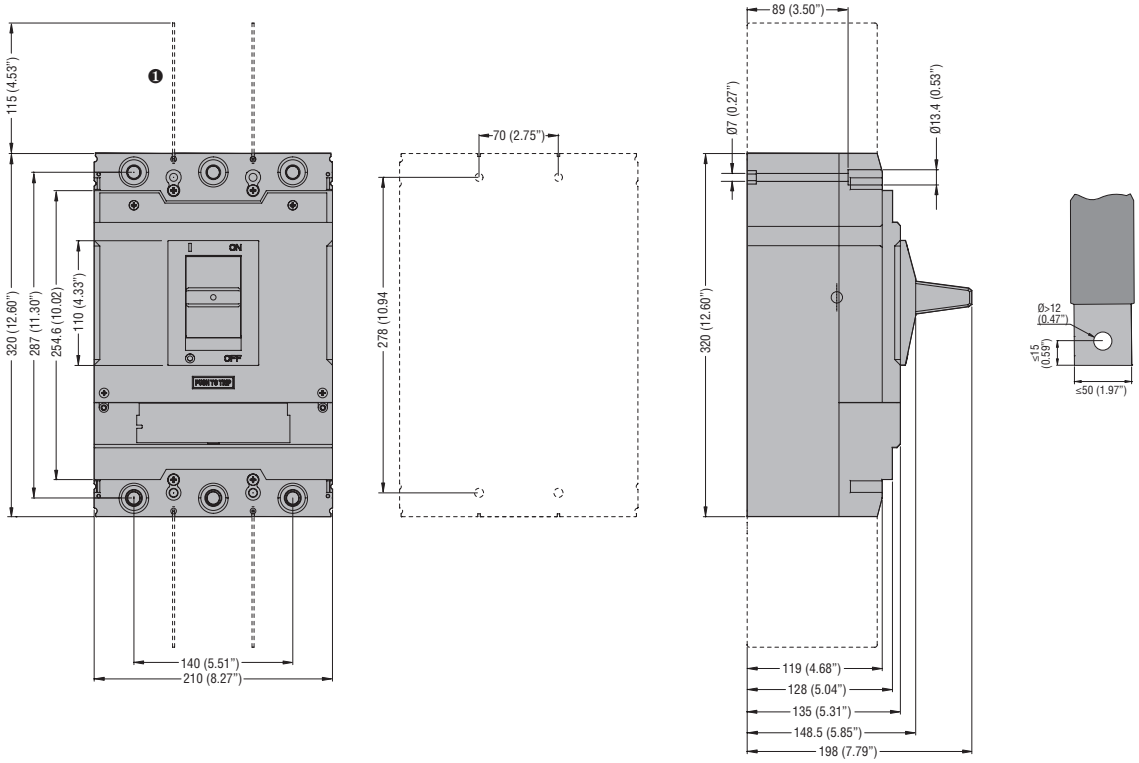


❶ Phase barriers

P5ME3PS0800



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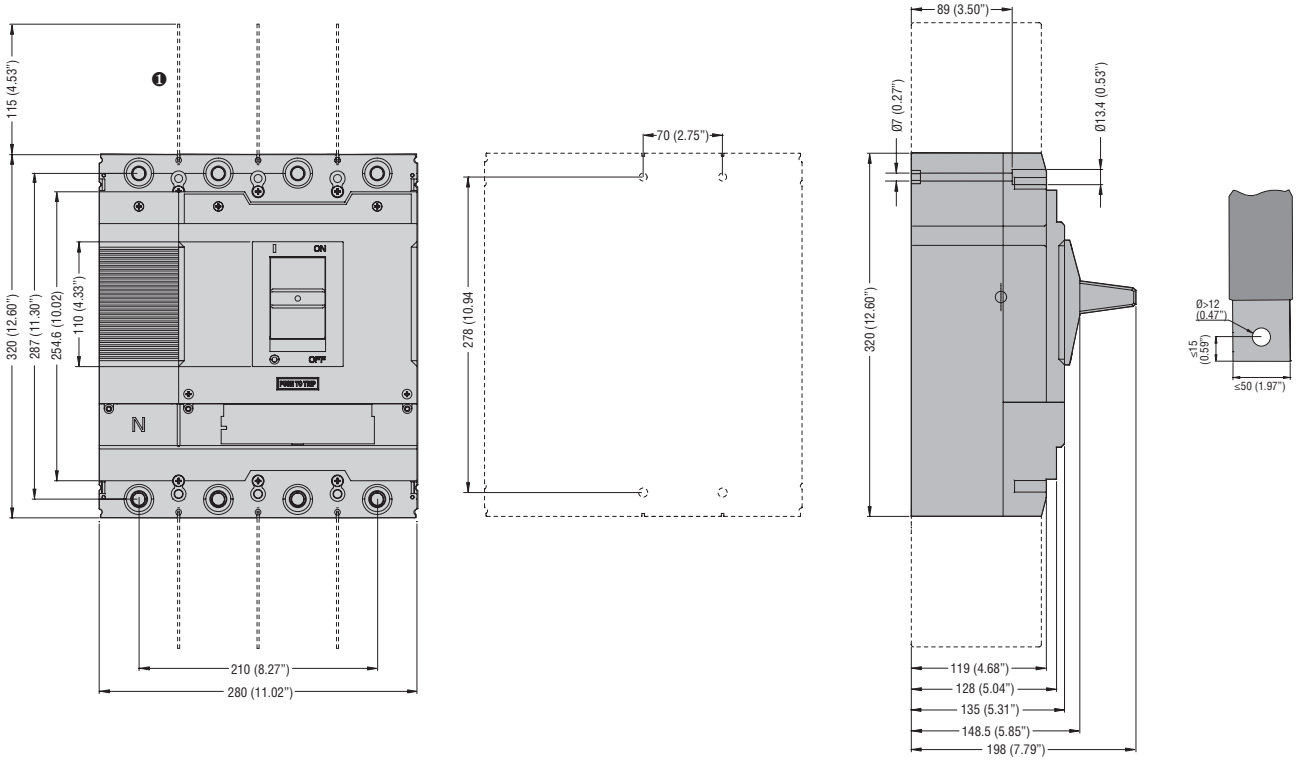

❶ Phase barriers

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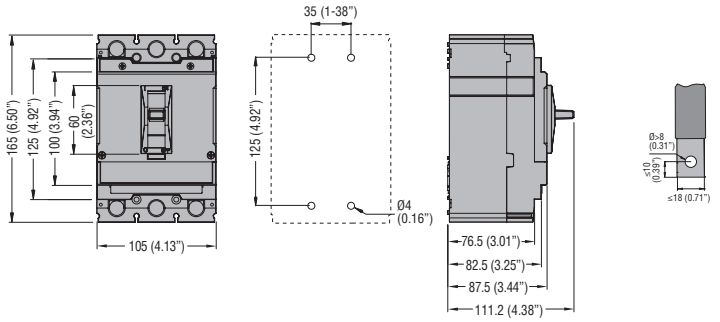

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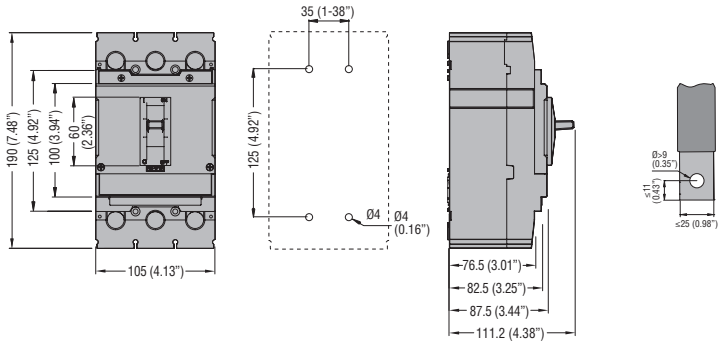

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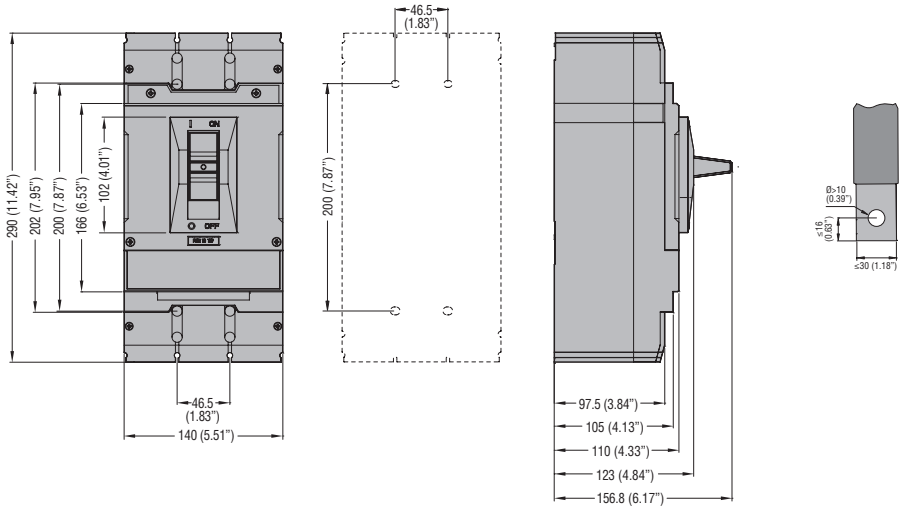

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