



Electromechanical starters



The ideal solution for every sort of motor and pump starting.

Orange starters, in plastic enclosure, are part of the range of LOVATO Electric electromechanical starters.

Their componibility system provides for simple assembly of

diverse equipment, in a rapid and safe way.

Orange are a flexible solution, ideal for industrial field, in civil building, greenhouses, cold storage and refrigeration, etc.

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Lovato electric

Direct-on-line and reversing starters



The new **Orange** enclosures offer excellent technical performance.

The IP65 protection degree consents installation in places exposed to harsh ambient conditions, such as dusts and strong water spraying or jets.

The starter integrity is warranted by the robustness of the plastic materials used, even in the case of strong impacts.

These features consent **Orange** starters to be suited for severe ambient conditions and meet stringent standard requirements of the North American market, UL and CSA approvals.



Starters in insulated IP65 enclosure



MO and M1 enclosures

Inside the enclosure, in addition to the starter composed by a contactor and thermal overload relay, one of the following devices of the modulo series can be fitted: time relays TM..., phase sequence - phase loss relay PMV10 A440,

level control relay LVM25 240 and priority change relay LVMP05.

These **moduLo** devices are 17.5mm wide (1 module) and must be fitted on the left side of the enclosure only.



The enclosure covers can be equipped with various types of actuators and pilot lights, per following details.

1) Upper position 1 The cover must be drilled in this position, with a 22.5mm diameter, by the user; 8 LM2T IL10... or 8 LP2T IL... pilot light can be fitted. To fit the 8 LM2T IL10... (not type 8 LP2T IL...) pilot light head, the MX 00 fixing adapter and the mounting base, type MX 20 for M0 enclosure, or type MX 21 for M1 enclosure, must also be purchased.

The lamp holder is snapped on to this mounting base.

2 Middle position 2

Based on the enclosure type, in this position, the user finds either the Start button or a plug in the 22.5mm hole. Various actuators can be fitted in this position, such as flush or extended push buttons, selectors or pilot lights, as illustrated in the side figure. To fit the actuators, the MX 00 fixing adapter, not required for 8 LP2T IL... pilot lights, and the mounting base, type MX 20 for M0 enclosure, or type MX 21 for M1 enclosure, must also be purchased.

The contact or lamp holder elements are snapped on to this mounting base.

3 Lower position 3

The Stop/Reset button is mounted in this position, except for the enclosure without buttons. This button activates the thermal overload relay via a mechanical actuator. In eventual applications without thermal overload relay, this button can be removed and the hole stopped up by the threaded plug 8 LM2 T A130.



Starters in insulated IP65 enclosure

M2 enclosure

Inside the enclosure, in addition to the starter composed by a contactor and thermal overload relay, the following devices of the **moduLo** series can be fitted: voltage monitoring relays PMV..., frequency relay PMF20..., level control relays LVM20-25-30..., and priority change relay LVMP05. One only of the following combinations can be fitted: n° 1 only 35mm wide relay on the right side of the enclosure

or n° 2 17.5mm wide relays on the right side only of the enclosure **or** n° 2 17.5mm wide relays one on the right and one on the left side of the enclosure. Switch disconnectors, 7 GS... A, can also be installed. Instead of the direct-on-line starter, reversing or changeover contactor assemblies up to BF25A can also be fitted with a thermal overload relay.







With thermal relay in insulated enclosure

Available versions up to $45kW \le 400V$.





Urder code	Relay adj	Relay Technical dj characteristics Te kW I 400V		Qty per pkg	Wt
	[A]	[A]	[kW]	n°	[kg]
Starters with Start and	Stop/Res	et pu	sh-buttons@		
MO POO9 12 0 1	0.6-1	1	0.18-0.25	1	0.800
M0 P009 12 0 1V5	0.9-1.5	1.5	0.37	1	0.800
MO POO9 12 0 2V3	1.4-2.3	2.3	0.55-0.75	1	0.800
M0 P009 12 0 33	2-3.3	3.3	1.1	1	0.800
MO POO9 12 0 5	3-5	5	1.5-2.2	1	0.800
M0 P009 12 0 75	4.5-7.5	7.5	2.2-3	1	0.800
MO POO9 12 0 10	6-10	9	3-4	1	0.800
M0 P012 12015	9-15	12	5.5	1	0.800
M1 P009 12 0 A4	0.63-1	1	0.25	1	1.040
M1 P009 12 0 A5	1-1.6	1.6	0.37-0.55	1	1.040
M1 P009 12 0 A6	1.6-2.5	2.5	0.75	1	1.040
M1 P009 12 0 A7	2.5-4	4	1.1-1.5	1	1.040
M1 P009 12 0 A8	4-6.5	6.5	2.2-3	1	1.040
M1 P009 12 0 A9	6.3-10	10	3-4	1	1.040
M1 P009 120B0	9-14	13	5.5	1	1.040
M1 P018 120B1	13-18	18	7.5	1	1.040
M2 P025 120B2	17-23	23	11	1	1.210
M2 P025 120B3	20-25	25	11	1	1.210
M2 P032 120B4	24-32	32	15	1	1.285
Starters with Reset push-button @.					

To order the starters with Reset push-button replace the letter P

For example: MO P009 1201 becomes MO R009 1201.

Components			
Starter enclosure	Contactor	Thermal relay	Auxiliary contact block
M0 PA	BG09 10A0	RF9 1	
M0 PA	BG09 10A0	RF9 1V5	-
M0 PA	BG09 10A0	RF9 2V3	-
M0 PA	BG09 10A0	RF9 33	-
M0 PA	BG09 10A0	RF9 5	-
M0 PA	BG09 10A0	RF9 75	-
M0 PA	BG09 10A0	RF9 10	-
M0 PA	BG12 10A0	RF9 15	-
M1 PA	BF09 10A0	RF38 0100	-
M1 PA	BF09 10A	RF38 0160	-
M1 PA	BF09 10A0	RF38 0250	-
M1 PA	BF09 10A0	RF38 0400	-
M1 PA	BF09 10A0	RF38 0650	-
M1 PA	BF09 10A	RF38 1000	-
M1 PA	BF09 10A0	RF38 1400	-
M1 PA	BF18 10A	RF38 1800	-
M2 PA	BF25 10A	RF38 2300	-
M2 PA	BF25 10A	RF38 2500	-
M2 PA	BF32 00A0	RF38 3200	G418 10

with the letter R

Certifications and compliance

Certifications obtained: UL and CSA. Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.

Without thermal relay in insulated enclosure

Available versions up to $95A \leq 440V$.



Order code	Maximum operating current ≤440V	Qty per pkg	Wt			
	[A]	n°	[kg]			
Starters with Start and	Stop/Reset push-buttons	0.				
M0 P009 10 0	9	1	0.677			
M0 P012 10 0	12	1	0.677			
M1 P009 10 0	13	1	0.917			
M1 P018 10 0	18	1	0.917			
M2 P025 10 0	25	1	1.087			
M2 P032 10 0	32	1	1.162			
Startare with Pacat nuch-button						

Starters with Reset push-button 2

To order the starters with Reset push-button replacing the letter P with the letter R

For example: MO P009 1001 becomes MO R009 1001

Components Starter Contactor Thermal Auxiliarv relay to contact enclosure purchase block separately M0 PA BG09 10A0 RF90 _ M0 PA BG12 10A0 RF90 M1 PA BF09 10A0 RF38@ M1 PA BF18 10A0 RF380 _ M2 PA BF25 10A0 RF38@ _ M2 PA BF32 00A0 RF38**⊘** G418 10

Certifications and compliance

Certifications obtained: UL and CSA. Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.

O Complete order code with coil voltage digit (if 50/60Hz) or with voltage digit followed by 60 (if 60Hz).

Standard voltages are as follows:

AC 50/60Hz 024 / 048 / 110 / 230 / 400VAC

024 60 / 048 60 / 120 60 / 220 60 / 230 60 / 460 60 / 575 60 (VAC). - AC 60Hz

Example M0 R009 12 024 1 for direct-on-line starter in M0 type enclosure with Start and Stop/Reset buttons, 9A/AC3 contactor with 24VAC 50/60Hz coil and 0.6-1A thermal overload relay. M0 P009 12 024 60 1 for direct-on-line starter in M0 type enclosure with Start and Stop/Reset buttons, 9A /AC3 contactor with 24VAC 60Hz coil and 0.6-1A thermal overload relay.

I e max ≤440V.

For thermal overload relay choice, consult our general catalogue or contact our Customer Service (Tel. +39 035 4282422).



Protection fuses are to be mounted externally by the user.

Starters in insulated IP65 enclosure rar

Accessories and spare parts Available versions up to 95A ≤400VAC for BF50-BF95 contactors.



Empty insulated enclosures

Order code	Contactor type 1	Thermal relay 🛛	Maximum operating current ≤440V	Qty per pkg	Wt
			[A]	n°	[kg]
Enclosures with	Start-Stop/I	Reset butto	ons.		
MOPA	BG06, BG09, BG12	RF9	12	1	0.490
M1PA	BF09A, BF12A, BF18A	RF38	18	1	0.545
M2PA	BF25A, BF26A, BF32A ⊚	RF38	32	1	0.715

Enclosures with Reset buttons.

To order the starters with Reset push-button replace the letter **PA** with the letter **RA**. For example: **MO PA** becomes **MO RA**.

Enclosures without external push-buttons.

To order the starters without external push-buttons, replace the letter PA with the letter N. For example: MO PA becomes MO N.

Accessories and spare parts

MX 00	
MX 20 MX 21	

Order code	Description	Qty per pkg	Wt
		n°	[kg]
MX 00	Button actuator fixing adapter	10	0.010
MX 10	Stop/Reset button extension rod for M0 enclosure	5	0.010
MX 11	Stop/Reset button extension rod for M1 enclosure	5	0.010
MX 12	Stop/Reset button extension rod for M2 enclosure	5	0.010
MX 20	Mounting base for 8LM2T C contact on MO enclosure	5	0.010
MX 21	Mounting base for 8LM2T C contact on M1 or M2 enclosure	5	0.010

To be purchased separately; for contactor choice, consult our general catalogue or contact our Customer Service (Tel. +39 035 4282422).
To be purchased separately; for thermal overload relay choice, consult our general catalogue or contact our Customer Service (Tel. +39 035 4282422).
Reversing contactor assemblies can be fitted as well.

Empty insulated enclosures are supplied with the following accessories:						
Enclosure	MO PA	M1 PA	M2 PA	MO RA	M1 RA	M2 RA
Mounting base MX 20	1					
MX 21		1	1			
Stop/Reset button 8 LP2T B1176				1	1	1
8 LP2T B2104	1	1	1			
Start button 8 LP2T B1113	1	1	1			
Contact element for Start button 8 LM2T C10	1	1	1			
Operator mounting adapter MX 00	2	2	2	1	1	1
Start/Reset button MX 10	1			1		
extension rod MX 11		1			1	
MX 12			1			1
Threaded plug for unused holes 8 LM2T A130				1	1	1



Starters in insulated IP65 enclosure

Additional components

Some of the more common elements, wich can be fitted on the M series enclosures, are given below. Others can be found in the general catalogue.



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Push buttons and selectors 22mm plastic

Colour

Extended (complete with mounting adapter). Spring return.

Red

Red

Order code

8 LP2T B2104 0

8 LP2T B2134 STOP

Switch disc	onnectors	A.C.	0		
Three-pole sw					
Order code	Rated power AC23 415V	Conventional free air thermal current Ith	Qty per pkg	Wt	
	[kW]	[A]	n°	[kg]	
Switch body for extension and h	door coupling andle.	version, to com	plete	with	
7 GS016 A	7.5	16	1	0.129	
7 GS025 A	11	25	1	0.129	
7 GS032 A	15	32	1	0.129	
Add-on acces	sories				
Order code	Characteristic	Qty per pkg	Wt		
			n°	[kg]	
Door coupling extension.					
7 GSS 070	70mm long		1	0.014	
Handles.					
7 GSH 2	Black. Padloc	kable. IP65	1	0.042	
7 GSH 3	Red/yellow. P	1	0.042		



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Electric de la secondada	5				
Flush (complete	with mounting	j adapter). Sprin	g retu	irn.	Order code
8 LP2T B103	Green		10	0.025	
8 LP2T B104	Red		10	0.025	
Extended (comp	lete with mour	nting adapter). S	pring	return.	
8 LP2T B203	Green		10	0.027	8 LP2T ILA3
8 LP2T B204	Red		10	0.027	8 LP2T ILA4
Flush (with side	visibilitv) (com	plete with moun	tina a	dapter).	8 LP2T ILB3
Spring return.	J) (5	· · [· · /	8 LP2T ILB4
8 LP2T BL103	Green		10	0.025	8 LP2T ILE3
8 LP2T BL104	Red		10	0.025	8 LP2T ILE4
Extended (comp	lete with mour	nting adapter). S	pring	return.	8 LP2T ILM3
8 LP2T BL203	Green		10	0.027	8 LP2T ILM4
8 LP2T BL204	Red		10	0.027	Accessories
Push-button a	ctuators, sp	ring return wi	ith sy	/mbol	Order code
Order code	Symbol	Colour	Qty per	Wt	
			pkg		
			n°	[kg]	8 LM2T A140
Flush (complete	with mounting	ı adapter). Sprin	g retu	irn.	0 L MOT 4400
8 LP2T B1104	0	Red	10	0.025	8 LIVIZT A130
8 LP2T B1113	1	Green	10	0.025	8 LM2T C10

10 0.027

10 0.027

Coloctor actuators knok

SCIECTOI ACTUA	1015-1100							
Order code	Type of positi	ions	Qty per pkg	Wt				
			n°	[kg]				
2 position (com	plete with mou	inting adapter).						
8 LP2T \$120		/	10	0.037				
3 position (com	plete with mou	inting adapter).						
8 LP2T \$130		/	10	0.037				
Selector actua	ators-lever							
2 position (com	on (complete with mounting adapter).							
8 LP2T \$220		/	10	0.037				
3 position (com	plete with mou	inting adapter).	1					
8 LP2T S230		/	10	0.037				
Selector actua	ators-key							
2 position (com	plete with mou	inting adapter).						
8 LP2T \$320	•	/	10	0.060				
3 position (com	plete with mou	Inting adapter).						
8 LP2T S330			10	0.060				
Illuminated se	elector actua	tors						
Order code	Type of positions	Colour	Qty per	Wt				
			ркд	[]]				
0 position (com	nlata with may	nting adaptar)	n-	[кд]				
	piele with mou	Creen	10	0.005				
8 LP2T SL1203		Bod	10	0.025				
2 position (com	nloto with mou	neu Inting adaptar)	10	0.025				
8 P2T SI 1303		Green	10	0.025				
8 I P2T SI 1304	\checkmark	Bed	10	0.025				
	l monoblook	nilot lighto o	tood	light				
		i pilot ligitis, s	leau					
Urder code	vonage	colour	per pkg	VVI				
			n°	[kg]				
8 LP2T ILA3	12VAC/DC	Green	10	0.021				
8 LP2T ILA4		Red	10	0.021				
8 LP2T ILB3	24VAC/DC	Green	10	0.021				
8 LP2T ILB4		Red	10	0.021				
8 LP2T ILE3	110VAC	Green	10	0.024				
8 LP2T ILE4		Red	10	0.024				
8 LP21 ILM3	230VAC	Green	10	0.024				
8 LP21 ILIVI4	Red			0.024				
Accessories								
Order code	Description			Wt				
				[kg]				
8 LM2T A140	Action plug for	or centre contact	50	0.001				
8 LM2T A130	Threaded plu holes	g for unused	10	0.007				
8 LM2T C10	NO contact		10	0.011				
8 LM2T C01	NC contact	10	0.011					

Note: Use the special MX 00 fixing adapter and MX20 or MX21 mounting base instead of the mounting adapter supplied with the pilot device to fix the contacts or lamp hol-der to the enclosure base; in this manner, the enclosure cover will be cable free.

Modular tin	ne relays			
Order code	Time of scale range	Supply voltage	Qty per pkg	Wt
		[V]	n°	[kg]
TM P		24-48VDC 24-240VAC		0.048
TM M1	0.1-1s 1-10s 6s-1min 1-10min			0.053
TM M2	ornin-Th 1-10h 0.1-1 day 1-10 days ON only 0 OFF only 0	12-240V AC/DC	1	0.078
TM PL	10-100 days 🥝			0.060

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For TM P, TM M1 and TM M2 only.

0	For	ТΜ	ΡL	only.	
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Protection	relays
Order code	Rated voltag

rder code	Rated voltage to be controlled Ue	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]

Single-phase system.

Minimum and maximum voltage control.				
PMV55 A240	PMV55 A240 208-240VAC 1 0.1			
PMV55 A440	A440 380-440VAC 1			
Order code	Rated voltage to be controlled Ue (phase to phase)	Qty per pkg	Wt	
	[V] 50/60Hz	n°	[kg]	

Three-phase system, without neutral.

Phase loss and incorrect phase sequence.					
PMV10 A440	208-440VAC	1	0.050		
PMV20 A240	100-240VAC	1	0.120		
PMV20 A575 208-575VAC		1	0.120		
PMV20 A600 380-600VAC		1	0.120		
Phase loss, incorrect phase sequence, minimum and maximum voltage control. Delayed tripping.					

PMV50 A240	208-240VAC	1	0.130
PMV50 A575	380-575VAC	1	0.130
PMV50 A600	600VAC	1	0.130

Level control relays

Level control relays				
Order code	Supply voltage	Type of output	Qty per	Wt
		contacts		pkg
	[V]	۲'	n°	[kg]

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Automatic resetting

LVM20 A024	24VAC	1 C/O	1	0.220
LVM20 A127	110-127VAC	1 C/O	1	0.220
LVM20 A240	220-240VAC	1 C/O	1	0.220
LVM20 A415	380-415VAC	1 C/O	1	0.220
Emptying or filling function.				
LVM25 240	24-240 VAC/DC	1 C/O	1	0.090

Modular priority change relay

2 outputs AC/DC supply voltage.				
	24/49//DC			ĺ

LVMP05	24/48VDC 24-240VAC	2 N/O	1	0.060	C.
		and a second second			- Aller

orange



ovato electric





Prewired limit switches type KP...





LVM series level control relays



Digital ammeter and voltmeter type DMK0... and DMK1...





LRD series programmable logic relays



Planet-SWITCH

- Motor protection circuit breakers Switch disconnectors
- Contactors
- Motor protection relays •
- Electromechanical starters Push buttons and selectors •
- Limit, micro and foot switches
- Rotary cam switches

Planet-DIN

- Modular contactors
- Time relays Protection relays
- Level control relays
- Earth leakage relays

Planet-LOGIC

- Digital metering instruments and current transformers
- Soft starters
- AC motor drives
- Automatic power factor controllers
- Automatic battery chargers
- Automatic transfer switch controllers
- Programmable logic relays

The products described in this documentation are subject to be revised or improved at any moment. Catalogue descriptions and details, such as technical and operational data, drawings, diagrams and instructions, etc., do not have any contractual value. In addition, products should be installed and used by qualified personnel and in com-pliance with the regulations in force for electrical systems in order to avoid damages and safety hazards.

LOVATO ELECTRIC S.P.A. CONTROL SOLUTIONS FOR INDUSTRY

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