

## 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.

# 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.

## M0 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 momodulo devices are 17.5 mm wide (1 module) and must be fitted on the left side of the enclosure only.


TM...
PMV10 A440
LVM25 240 LVMP05

8 LM2T L...
8 LM2T EL400 8 LM2T ZL230




8 LP2T IL...
 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 22.5 mm 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 22.5 mm 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 MO 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:
$n^{\circ} 1$ only 35 mm wide relay on the right side of the enclosure
or $n^{\circ} 217.5 \mathrm{~mm}$ wide relays on the right side only of the enclosure or $n^{\circ} 217.5 \mathrm{~mm}$ 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.


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

## 1) Upper position 1 <br> The cover must be drilled in this position, with a 22.5 mm 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, the MX 00 fixing adapter and the mounting base type MX 21, must also be purchased. The lamp holder is snapped on to this mounting base. <br> (2) Middle position 2 <br> Based on the enclosure type, in this position, the user finds either the Start button or a plug in the 22.5 mm 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 light, and the mounting base type MX 21, 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 LM2T A130. 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 light, and the mounting base type MX 21, must also be purchased. The contact or lamp holder elements are snapped on to this mounting base.

## Upper position 4

The cover must be drilled in this position, with a 22.5 mm diameter, by the user.

## With thermal relay in insulated enclosure <br> Available versions up to $45 \mathrm{~kW} \leq 400 \mathrm{~V}$.



To order the starters with Reset push-button replace the letter $\mathbf{P}$ with the letter $\mathbf{R}$.
For example: MO POO9 1211 becomes MO R009 1211

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

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 <br> Available versions up to $95 \mathrm{~A} \leq 440 \mathrm{~V}$.



| Order code | Maximum operating <br> current s440V | Qty <br> per <br> pkg | Wt |  |
| :--- | :--- | :--- | :--- | :---: |
|  | $[\mathrm{A}]$ | $\mathrm{n}^{\circ}$ | $[\mathrm{kg}]$ |  |
| Starters with Start and |  |  |  |  |
| Stop/Reset push-buttons $\mathbf{0}$. |  |  |  |  |
| M0 P009 100 | 9 | 1 | 0.677 |  |
| M0 P012 100 | 12 | 1 | 0.677 |  |
| M1 P009 100 | 13 | 1 | 0.917 |  |
| M1 P018 100 | 18 | 1 | 0.917 |  |
| M2 P025 100 | 25 | 1 | 1.087 |  |
| M2 P032 100 | 32 | 1 | 1.162 |  |

Starters with Reset push-button (2).
To order the starters with Reset push-button replacing the letter
$\mathbf{P}$ with the letter $\mathbf{R}$.
For example: MO P009 $\mathbf{1 0 0 1}$ becomes MO R009 1001
Components

| Starter <br> enclosure | Contactor | Thermal <br> relay to <br> purchase <br> separately | Auxiliary <br> contact <br> block |
| :--- | :--- | :--- | :--- |
| M0 PA | BG09 10A© | RF94 | - |
| M0 PA | BG12 10A© | RF94 | - |
| M1 PA | BF09 10A© | RF384 | - |
| M1 PA | BF18 10A | RF384 | - |
| M2 PA | BF25 10A | RF384 | - |
| M2 PA | BF32 00A | RF384 | G418 10 |

## Certifications and compliance

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

[^0][^1]Starters in insulated IP65 enclosure

## Accessories and spare parts <br> Available versions up to $95 \mathrm{~A} \leq 400 \mathrm{VAC}$ for BF50-BF95 contactors.

Empty insulated enclosures

| Order code | Contactor <br> type © | Thermal <br> relay (2) | Maximum <br> operating <br> current $\leq 440 \mathrm{~V}$ | Qty <br> per <br> pkg | Wt |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Enclosures with Start-Stop/Reset buttons. <br> M0PABG06, <br> BG09, <br> BG12 |  |  |  |  |  |
| RF9 | 12 | $\mathrm{n}^{\circ}$ | $[\mathrm{kg}]$ |  |  |
| M1PA | BF09A, <br> BF12A, <br> BF18A | RF38 | 18 | 1 | 0.490 |
| M2PA | BF25A, <br> BF26A, <br> BF32AB | RF38 | 32 | 1 | 0.545 |

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 $\mathbf{N}$. For example: MO PA becomes MO $\mathbf{N}$.

Accessories and spare parts


| Order code | Description | Qty <br> per <br> pkg | Wt |
| :--- | :--- | :--- | :--- |
| MX 00 | Button actuator fixing adapter | 10 | 0.010 |
| MX 10 | Stop/Reset button extension <br> rod for M0 enclosure | 5 | 0.010 |
| MX 11 | Stop/Reset button extension <br> rod for M1 enclosure | 5 | 0.010 |
| MX 12 | Stop/Reset button extension <br> rod for M2 enclosure | 5 | 0.010 |
| MX 20 | Mounting base for 8LM2T C... <br> contact on M0 enclosure | 5 | 0.010 |
| MX 21 | Mounting base for 8LM2T C... <br> contact on M1 or M2 enclosure | 5 | 0.010 |
| (1) To be purchased separately; for contactor choice, consult our general catalogue or <br> contact our Customer Service (Tel. +39 035 4282422). <br> (2 To be purchased separately; for thermal overload relay choice, consult our general <br> catalogue or contact our Customer Service (Tel. +39 035 4282422). <br> (3 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 |  |  |  |
| $\begin{aligned} & \text { Stop/Reset button } \\ & 8 \text { LP2T B1176 } \end{aligned}$ |  |  |  | 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 $\mathbf{M}$ series enclosures, are given below.
Others can be found in the general catalogue.


Switch disconnectors Three-pole switches

| Order code | Rated power <br> AC23 415V | Conventional <br> free air thermal <br> current Ith | Qty <br> per <br> pkg | Wt |
| :--- | :--- | :--- | :--- | :--- |
|  | $[\mathrm{kW}]$ | $[\mathrm{A}]$ | $\mathrm{n}^{\circ}$ | $[\mathrm{kg}]$ |

Switch body for door coupling version, to complete with extension and handle.

| 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 accessories

| Order code | Characteristics | Qty <br> per <br> pkg | Wt |  |
| :--- | :--- | :--- | :--- | :---: |
|  |  |  |  |  |
|  |  |  |  |  |
| Door coupling extension. |  |  |  |  |
| 7 GSS 070 | 70 mm long | 1 | 0.014 |  |
| Handles. |  |  |  |  |
| 7 GSH 2 | Black. Padlockable. IP65 | 1 | 0.042 |  |
| 7 GSH 3 | Red/yellow. Padlockable. IP65 | 1 | 0.042 |  |

Push buttons and selectors 22 mm plastic
Push-button actuators, spring return

| Order code | Colour | Qty <br> per <br> pkg |  |
| :--- | :--- | :--- | :--- |
|  |  | $\mathrm{n}^{\circ}$ | $[\mathrm{kg}]$ |

Flush (complete with mounting adapter). Spring return.

| 8 LP2T B103 | Green | 10 | 0.025 |
| :--- | :--- | :--- | :--- |
| 8 LP2T B104 | Red | 10 | 0.025 |

Extended (complete with mounting adapter). Spring return.

| 8 LP2T B203 | Green | 10 | 0.027 |
| :--- | :--- | :--- | :--- |
| 8 LP2T B204 | Red | 10 | 0.027 |

Flush (with side visibility) (complete with mounting adapter).
Spring return.

| 8 LP2T BL103 | Green | 10 | 0.025 |
| :--- | :--- | :--- | :--- |
| $\mathbf{8}$ LP2T BL104 | Red | 10 | 0.025 |

Extended (complete with mounting adapter). Spring return.

| 8 LP2T BL203 | Green | 10 | 0.027 |
| :--- | :--- | :--- | :--- |
| 8 LP2T BL204 | Red | 10 | 0.027 |

Push-button actuators, spring return with symbol

| Order code | Symbol | Colour | Qty <br> per <br> pkg | Wt |
| :--- | :--- | :--- | :--- | :--- |
|  |  |  | $\mathrm{n}^{\circ}$ | $[\mathrm{kg}]$ |

Flush (complete with mounting adapter). Spring return.

| 8 LP2T B1104 | 0 | Red | 10 | 0.025 |
| :--- | :--- | :--- | :--- | :--- |
| 8 LP2T B1113 | I | Green | 10 | 0.025 |

Extended (complete with mounting adapter). Spring return.

| 8 LP2T B2104 | 0 | Red | 10 | 0.027 |
| :--- | :--- | :--- | :--- | :--- |
| 8 LP2T B2134 | STOP | Red | 10 | 0.027 |

Selector actuators-knob

| Order code | Type of positions | Qty <br> per <br> pkg | Wt |
| :--- | :--- | :--- | :--- |
|  |  | $\mathrm{n}^{\circ}$ | $[\mathrm{kg}]$ |


|  |  |  |  |
| :--- | :--- | :--- | :--- |
| 2 position (complete with mounting adapter). |  |  |  |
| $\mathbf{8}$ LP2T S120 | $\checkmark$ | 10 | 0.037 |

3 position (complete with mounting adapter).

8 LP2T S130 $\qquad$ | 10 | 0.037 |
| :--- | :--- | :--- |

## Selector actuators-lever

2 position (complete with mounting adapter).

| $\mathbf{8}$ LP2T S220 | $\vee$ | 10 | 0.037 |
| :--- | :---: | :--- | :--- |
| 3 position (complete with mounting adapter). |  |  |  |
| $\mathbf{8}$ LP2T S230 | $\bigvee$ | 10 | 0.037 |

## Selector actuators-key

2 position (complete with mounting adapter).

| $\mathbf{8}$ LP2T S320 | $\bullet$ | 10 | 0.060 |
| :--- | :---: | :---: | :---: |
| position (complete with mounting adapter). |  |  |  |
| $\mathbf{8}$ LP2T S330 | $\dot{V}$ | 10 | 0.060 |

## Illuminated selector actuators

| Order code | Type of positions | Colour | $\begin{aligned} & \text { Qty } \\ & \text { per } \end{aligned}$ pkg | Wt |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\mathrm{n}^{\circ}$ | [kg] |
| 2 position (complete with mounting adapter). |  |  |  |  |
| 8 LP2T SL1203 | $V$ | Green | 10 | 0.025 |
| 8 LP2T SL1204 |  | Red | 10 | 0.025 |


| 3 position (complete with mounting adapter). |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| 8 LP2T SL1303 | $\checkmark$ | Green | 10 | 0.025 |
| 8 LP2T SL1304 |  | Red | 10 | 0.025 |

LED integrated monoblock pilot lights, steady light

| Order code | Voltage | LED colour | $\begin{aligned} & \text { Qty } \\ & \text { per } \\ & \text { nk } \end{aligned}$ pkg | Wt |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\mathrm{n}^{\circ}$ | [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 LP2T ILM3 | 230VAC | Green | 10 | 0.024 |
| 8 LP2T ILM4 |  | Red | 10 | 0.024 |

## Accessories

| Order code | Description | Qty <br> per <br> pkg | Wt |
| :--- | :--- | :--- | :--- |
|  |  | $\mathrm{n}^{\circ}$ | $[\mathrm{kg}]$ |
| $\mathbf{8}$ LM2T A140 | Action plug for centre contact | 50 | 0.001 |
| $\mathbf{8}$ LM2T A130 | Threaded plug for unused <br> holes | 10 | 0.007 |
| $\mathbf{8}$ LM2T C10 | NO contact | 10 | 0.011 |
| $\mathbf{8}$ LM2T C01 | NC contact | 10 | 0.011 |

[^2]
(1) For TM P, TM M1 and TM M2 only.
(2) For TM PL only.

## Level control relays

| Order code | Supply <br> voltage | Type of <br> output <br> contacts | Qty <br> per | Wt <br> pkg |
| :--- | :--- | :--- | :--- | :--- |
|  | $[\mathrm{V}]$ | $\mathrm{T}^{\prime}$ | $\mathrm{n}^{\circ}$ | $[\mathrm{kg}]$ |

## Automatic resetting

| LVM20 A024 | 24 VAC | $1 \mathrm{C} / 0$ | 1 | 0.220 |
| :--- | :--- | :--- | :--- | :--- |
| LVM20 A127 | $110-127$ VAC | $1 \mathrm{C} / 0$ | 1 | 0.220 |
| LVM20 A240 | $220-240$ VAC | $1 \mathrm{C} / 0$ | 1 | 0.220 |
| LVM20 A415 | $380-415$ VAC | $1 \mathrm{C} / 0$ | 1 | 0.220 |

Emptying or filling function.

| LVM25 240 | $24-240$ <br> VAC/DC | $1 \mathrm{C} / 0$ | 1 | 0.090 |
| :--- | :--- | :--- | :--- | :--- |

Modular priority change relay
2 outputs AC/DC supply voltage.

| LVMP05 | $24 / 48 \mathrm{VDC}$ <br> $24-240 V A C$ | 2 N/0 | 1 | 0.060 |
| :--- | :--- | :--- | :--- | :--- |

## Protection relays

| Order code | Rated voltage <br> to be controlled Ue | Qty <br> per <br> pkg | Wt |
| :--- | :--- | :--- | :--- |
|  | $[\mathrm{V}] 50 / 60 \mathrm{~Hz}$ | $n^{\circ}$ | $[\mathrm{kg}]$ |

Single-phase system.

| Minimum and maximum voltage control. |  |  |  |  |
| :--- | :--- | :--- | :--- | :---: |
| PMV55 A240 | 208-240VAC | 1 | 0.125 |  |
| PMV55 A440 | $380-440$ VAC | 1 | 0.125 |  |
| Order code | Rated voltage <br> to be controlled Ue <br> (phase to phase) | Qty <br> per <br> pkg | Wt |  |
|  | $[\mathrm{V}] 50 / 60 \mathrm{~Hz}$ | $\mathrm{n}^{\circ}$ | $[\mathrm{kg}]$ |  |

Three-phase system, without neutral.
Phase loss and incorrect phase sequence.

| PMV10 A440 | $208-440 V A C$ | 1 | 0.050 |
| :--- | :--- | :--- | :--- |
| PMV20 A240 | $100-240 V A C$ | 1 | 0.120 |
| PMV20 A575 | $208-575 V A C$ | 1 | 0.120 |
| PMV20 A600 | $380-600 V A C$ | 1 | 0.120 |

Phase loss, incorrect phase sequence, minimum and maximum voltage control. Delayed tripping.

| PMV50 A240 | $208-240 V A C$ | 1 | 0.130 |
| :--- | :--- | :--- | :--- |
| PMV50 A575 | $380-575 V A C$ | 1 | 0.130 |
| PMV50 A600 | $600 V A C$ | 1 | 0.130 |



## Planet:SW/JCH

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


## PEanetidis

## - 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,
tc., do not have any contractual value. In used by, pualified personnel and in comused by qualified personnel and in complectrical systems in order to avoid damages and safety hazards.


LRD series programmable logic relays

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[^0]:    (1) Complete order code with coil voltage digit (if $50 / 60 \mathrm{~Hz}$ ) or with voltage digit followed by 60 (if 60 Hz ).
    Standard voltages are as follows:

    - AC 50/60Hz 024/048/110/230/400VAC
    - AC 60Hz $02460 / 04860 / 12060 / 22060 / 23060 / 46060 / 57560$ (VAC).

[^1]:    (2) Protection fuses are to be mounted externally by the user 3 le max $\leq 440 \mathrm{~V}$.
    (4) For thermal overload relay choice, consult our general catalogue or contact our Customer Service (Tel. +390354282422 ).

[^2]:    Note:
    Use the special MX 00 fixing adapter and MX20 or MX21 mounting base instead of unting adapter supplied with the pilot device to fix the contacts or lamp hoder to the enclosure base; in this manner, the enclosure cover will be cable free.

