# MI-START

Soft Starters

## SOFT STARTER SELECTION SUMMARY

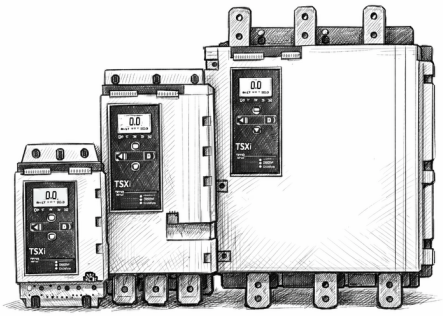
### YOUR APPLICATION

**Industry:**
**Application:**
**Environment:**

**Line Voltage:**
**Motor Size:**

### MODEL SELECTION

**Series:** TSXi
**Model Number:** TSXi-0069B-V7



**Max Motor FLC:**
**Start Current:**
**Start Duration:**

NOTE: If the expected operational duty exceeds stated starter capability shown above contact your local representative who will verify correct starter selection.

### OPTIONAL ACCESSORIES

**Remote HMI**

*includes*

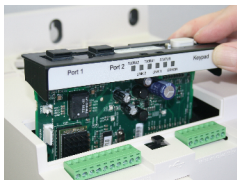
- Status Indication
- Start/Stop/Reset
- Programming
- Graphical Display
- Hot Keys

**Finger Guards**

*models*

- 0184B-0580B
- 0835B-1250B

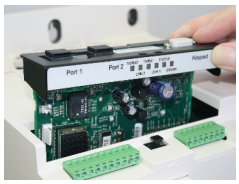
**Fieldbus**



*protocols*

- Profibus
- ProfiNet *
- Modbus TCP *
- Modbus RTU *
- DeviceNet
- Ethernet IP *

**Smart Cards**



*options*

- Pump Card

* Ground fault option available

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## STANDARD FEATURES

### INTERFACE

| | | | |
|---|---|---|---|
| Plain Language display | 8 Languages | LED Status Indication | Graphing |

### START / STOP FUNCTION

| | | | |
|---|---|---|---|
| Voltage Ramp Start | Constant Current Start | Adaptive Start/Stop | D.C. Brake |
| Kick Start | Current Ramp Start | Voltage Ramp Stop | Soft Braking |
| Scheduled Start / Stop | Reverse Direction | | |

### MOTOR AND SYSTEM PROTECTIONS

| | | | |
|---|---|---|---|
| Motor Overload | Current imbalance | Phase Loss | Underpower |
| Motor Connection Fault | Overcurrent | Phase Sequence | Overpower |
| Instant Over Current (Jam) | Undercurrent | Undervoltage | SCR Overload (ITSM) |
| Excess Start Time (Stall) | External Trip Inputs | Overvoltage | Internal Bypass Overload |
| Too many starts | Motor Thermistor | Line Frequency | |

### MONITORING

| | | | |
|---|---|---|---|
| Phase currents | Current phase imbalance | Motor Power | *With PUMP SMART CARD* |
| Average current | Thermal Capacity: starter | Power Factor | ▪ Pump Pressure |
| Hours Run | Thermal Capacity: motor | High current flag | ▪ Pump Flow |
| Start Counter | Analogue Output Value | Low current flag | ▪ Well depth |
| Line frequency | Line-to-line voltage | Motor temperature flag | ▪ Pump Temperature |
| Last Start Details | Average voltage | Ground Fault (Option) | |

### ANCILLARY FUNCTIONS

| | | | |
|---|---|---|---|
| Jog | Emergency Mode | Dual Motor Sets | Programable Protection Action: |
| Inside Delta Operation | Power-Through Mode | Pump Clean | • Soft Stop Trip |
| Motor Reverse Control | Second Motor Set | Run Timers | • Soft Stop Trip + Auto Reset |
| Restart Delay: Antibackspin | Auto Reset | Weekly Scheduling | • Trip |
| Auto-Start/Stop | Soft Brake Control | Simulation Tools | • Trip + Auto Reset |
| | | | • Warn and Log |
| | | | • Log Only |
| | | | • Trip + Shunt relay Trip |

### ACTIVITY LOGS – 384 EVENTS

| | | | |
|---|---|---|---|
| Date and Time | Average Current | Motor Thermistor State | Rating Capacity |
| Event type | Phase 1 Current | Ambient Temp | Voltage |
| Event Source | Phase 2 Current | Start Heatsink Temp | Power Factor |
| Event Action Detail 1 | Phase 3 Current | Motor Thermal Models | MI-START Support App |
| Event Action Detail 2 | Frequency | SCR Temp | |
| Started in (s) | Starter State At Event | Bypass Contactor Temp | |

## SPECIFICATIONS

### SUPPLY

| | | |
|---|---|---|
| Main Voltage L1,L2,L3 | TSXi-xxxxB-V5 | 200~525 VAC (+/- 10%) |
| | TSXi-xxxxB-V7 | 380~690 VAC (+/- 10%) |
| Control Voltage A1,A2,A3 | TSXi-xxxxB-xx-C1 (A1, A2) | 110~120 VAC (+10%/-15%), 600mA |
| | TSXi-xxxxB-xx-C1 (A2, A3) | 220~240 VAC (+10%/-15%), 600mA |
| | TSXi-xxxxB-xx-C2 (A1, A2) | 24 VAC/VDC (+/- 20%), 2.8A |
| Mains Frequency | 50 Hz~60 Hz (+/- 5%) | |
| Rated insulation | 600 VAC to earth | |
| Rated impulse withstand | 6 kV | |
| Form designation | Bypassed semiconductor motor starter form 1 | |

### SHORT CIRCUIT CAPABILITY

| | |
|---|---|
| Coordination with semiconductor fuses | Type 1 |
| Coordination with HRC fuses | Type 2 |

### ELECTROMAGNETIC CAPABILITY (COMPLIANT WITH EU DIRECTIVE 2014/35/EU)

| | |
|---|---|
| EMC Immunity | IEC 60947-4-2 |
| EMC Emissions | IEC 60947-4-2 Class B |

### INPUTS

| | |
|---|---|
| Input rating | Active 24 VDC, 8mA approx.. |
| Motor thermistor (B4, B5) | Trip >3.6 kΩ, reset <1.6 kΩ |

### OUTPUTS

| | | |
|---|---|---|
| Relay Outputs | 10 A @ 250 VAC resistive, 5A @ 250 VAC AC15 pf 0.3 | |
| | Main Contactor (33,34) | Normally open |
| | Relay output A (41, 42, 44) | Changeover |
| | Relay output B (53, 54) | Normally open |
| Analog Output (21, 22) | Maximum load | 600Ω (12VDC @ 20 mA) |
| | Accuracy | +/- 5% |

### ENVIRONMENT

| | | |
|---|---|---|
| Operating Temperature | -10°C~60°C above 40°C with derating | |
| Storage Temperature | -25°C~+60°C | |
| Operating Altitude | 0-1000m, above 1000m with derating | |
| Humidity | 5%~95% Relative Humidity | |
| Pollution Degree | Pollution Degree 3 | |
| Vibration | IEC 60068-2-6 | |
| Protection | 0024B~0135B | IP20 |
| | 0184B~1250B | IP00 |

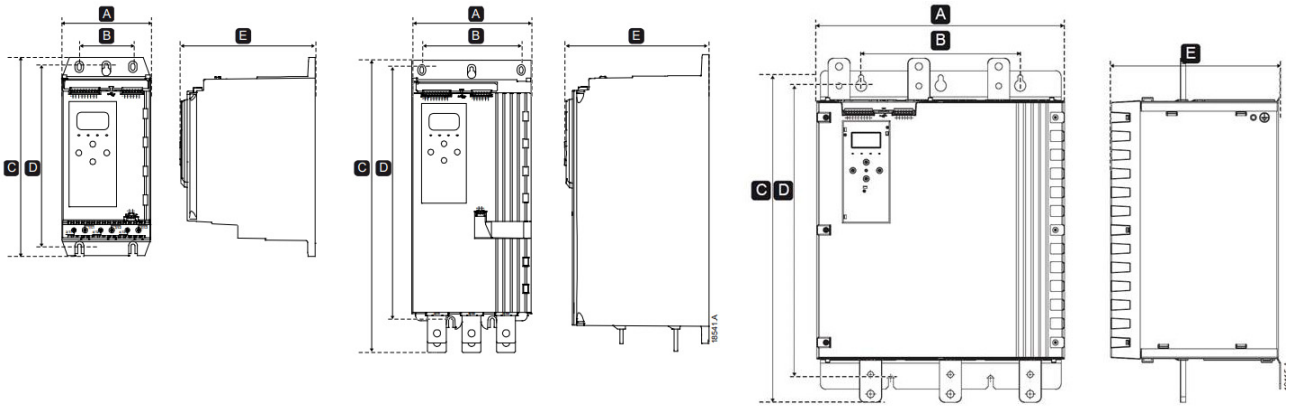
### HEAT DISSIPATION

| | | | | |
|---|---|---|---|---|
| During Start | 4.5 watts per ampere | | | |
| During Run | 0024B~0052B | ≤ 35 watts approx. | 0352B~0580B | ≤ 140 watts approx. |
| | 0064B~0135B | ≤ 50 watts approx. | 0835B~1250B | ≤ 180 watts approx. |
| | 0184B~0250B | ≤ 120 watts approx. | | |

### APPROVALS

| | | | |
|---|---|---|---|
| CE | EN 60947-4-2 | RCM | IEC 60947-4-2 |

## DIMENSIONS & WEIGHTS




| | Width | | Height | | Depth | Weight |
|---|---|---|---|---|---|---|
| **Model** | **A** | **B** | **C** | **D** | **E** | |
| TSXi-0024B~0042B | 152 (6.0) | 92 (3.6) | 336 (13.2) | 307 (12.1) | 231 (9.1) | 4.8 (10.7) |
| TSXi-0052B~0069B | | | | | | 4.9 (10.9) |
| TSXi-0105B~0135B | | | | | | 5.5 (12.1) |
| TSXi-0184B~0250B | 216 (8.5) | 180 (7.1) | 495 (19.5) | 450 (17.7) | 243 (9.6) | 12.7 (28.0) |
| TSXi-0352B~0401B | | | 523 (20.6) | | | 15.5 (34.2) |
| TSXi-0550B~0580B | | | | | | 19.0 (41.9) |
| TSXi-0835B~0940B | 446 (17.6) | 287 (11.3) | 618 (24.3) | 540 (21.3) | 310 (12.2) | 61.0 (134.5 |
| TSXi-1070B~1230B | | | | | | 63.0 (139.9) |
| TSXi-1250B | | | | | | 65.0 (143.3) |

mm (inches) kg (lbs)