

Fractional HP Starters, Class SMF

Class SMF

Class SMF fractional horsepower starters provide overload protection as well as manual on-off control for small horsepower motors in a variety of industrial and commercial applications. Available in one or two pole versions, these devices are suitable for use with AC single phase motors up to 1 HP. Two pole starters can also be used with DC motors up to 3/4 HP. Typical applications include fans, conveyors, pumps, and small machine tools.

Continuous Current Rating

16 amperes.

Overload Trip Assembly

Motor protection is provided by a Class SMFH heater element which must be installed before the starter will operate.

Two Speed Starters

Two speed manual starters are designed for control of small single phase AC motors having separate windings for high and low speed operation. Two toggle operated starters are used, with overload protection included for each motor winding. Surface mounting devices, and those with a gray flush plate, utilize a mechanical interlock which allows direct control of the motor by means of the toggle operators.

Enclosures

Class SMF, NEMA Type 1 surface mounting enclosures are sheet steel with a thermo-plastic wrap-around cover for convenience in wiring. The NEMA Type 1 enclosure is also available in an oversized version which allows more wiring space. A zinc alloy die casting is used for NEMA Type 4 enclosures.

Pilot Lights

Red or green neon pilot light units are available factory installed in Class SMF, NEMA Type 1 surface and flush mounting and NEMA Type 4 enclosures or as a field modification kit for NEMA Type 1 enclosures and gray flush plates. (Red pilot light—standard. Green pilot light—add "G" to end of type number.)

Terminals

Binding head screw type terminals are suitable for #10 or smaller copper wire, and are accessible from the front. All terminals are clearly marked.

Mounting

Open types without a pilot light fit standard single gang switch boxes, and can be used with any cover plate having a standard toggle cutout. Single-unit flush mounting types, including those with pilot lights, are suitable for wall mounting in a standard switch box or for machine cavity mounting without a box.

Operation

Available with toggle handle or with removable key type operator to discourage unauthorized operation.



Emergency Off Actuator

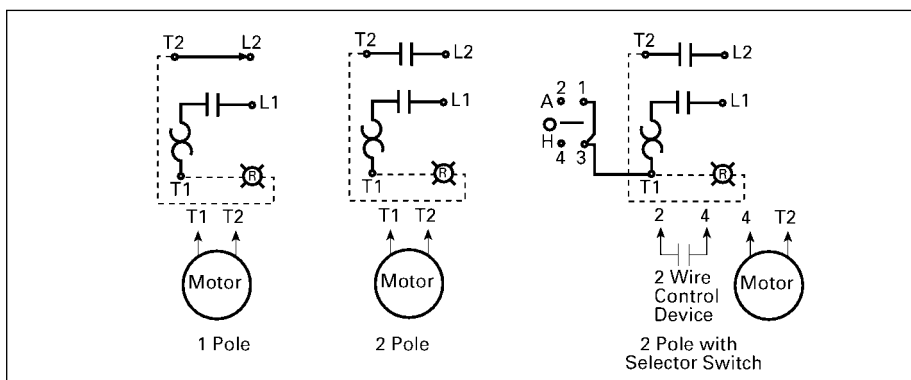
A toggle operator extender is available for Class SMF, NEMA Type 1 surface mounted units. The extender has a red vinyl button that provides a fast and easy method for locating and switching the device's toggle operator into the OFF position. The Emergency Off Actuator is available in kit form only for field installation.

Handle Guard/Lock-Off

An optional handle guard on Class SMF, NEMA Type 1 enclosed starters prevents accidental operation of the toggle operator and also allows the toggle operator to be padlocked in either the "ON" or the "OFF" position. This handle guard can be factory installed on NEMA Type 1 enclosed starters and is also available in kit form for field installation on NEMA Type 1 surface and flush mounting enclosures. Standard NEMA Type 4 metallic includes provision for padlocking in the OFF position.


2
NEMA and HP
Rated Control

Typical Wiring Diagrams—Class SMF





Fractional HP Starters with Melting Alloy Overload, Class SMF

 <p>Class SMF Motor Starter</p>	Ordering Information				Horsepower Ratings																					
	<ul style="list-style-type: none"> ▶ Heater Elements see page 31. ▶ Accessories see page 34. ▶ Dimensions see pages 35–36. ▶ Wiring Diagrams see page 29. ▶ Application Data see page 29. 				<table border="1"> <tr> <td rowspan="3">Volts</td> <td colspan="3">Maximum Horsepower</td> </tr> <tr> <td colspan="2">AC Single Phase</td> <td>DC</td> </tr> <tr> <td>1 Pole</td> <td>2 Pole</td> <td>2 Pole</td> </tr> <tr> <td>115–230</td> <td>1</td> <td>1</td> <td>¾</td> </tr> <tr> <td>277</td> <td>1</td> <td>1</td> <td>—</td> </tr> </table>				Volts	Maximum Horsepower			AC Single Phase		DC	1 Pole	2 Pole	2 Pole	115–230	1	1	¾	277	1	1	—
	Volts	Maximum Horsepower																								
		AC Single Phase		DC																						
1 Pole		2 Pole	2 Pole																							
115–230	1	1	¾																							
277	1	1	—																							

Basic Starter—Class SMF, Single Phase

Type of Operator	No. of Poles	Features	Open Type		General Purpose Flush Mounting (Open with Flush Plate)						NEMA Type 1 General Purpose Enclosure Surface Mounting				NEMA Type 3R, 4 and 12 Watertight, Dust-tight Enclosure		NEMA Type 4 Watertight, Dust-tight Metallic Enclosure		NEMA Type 7 & 9 Class I Groups B, C, D & Class II Groups E, F, G Enclosures	
			Catalog No	Price \$	Gray Flush Plate	Standard Stainless Steel Flush Plate	Jumbo Stainless Steel Flush Plate	Standard	Oversized	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	
Toggle	1	Standard— With Red Pilot Light—	SMFF01 62.00	38.50 62.00	SMFFF1 65.00	42.50 65.00	SMFFS1 69.00	45.00 69.00	—	—	SMFFG1 69.00	46.00 81.00	SMFFGJ1 77.00	54.00 77.00	SMFFWN1 169.00	162.00 169.00	—	—	—	—
	2	Standard— With Red Pilot Light—	SMFF02 69.00	46.00 69.00	SMFFF2 73.00	50.00 73.00	SMFFS2 77.00	54.00 77.00	—	—	SMFFG2 77.00	54.00 89.00	SMFFGJ2 85.00	62.00 85.00	SMFFWN2 231.00	223.00 231.00	—	—	—	—
Key	1	Standard— With Red Pilot Light—	SMFF03 77.00	54.00 77.00	SMFFF3 73.00	58.00 73.00	SMFFS3 96.00	62.00 96.00	—	—	SMFFG3 85.00	62.00 96.00	SMFFGJ3 92.00	69.00 92.00	SMFFWN3 185.00	177.00 185.00	—	—	—	—
	2	Standard— With Red Pilot Light—	SMFF04 85.00	62.00 85.00	SMFFF4 89.00	65.00 89.00	SMFFS4 92.00	69.00 92.00	—	—	SMFFG4 92.00	69.00 100.00	SMFFGJ4 100.00	77.00 100.00	SMFFWN4 247.00	239.00 247.00	—	—	—	—

Starter With Handle Guard Lock Off—Class SMF, Single Phase

Toggle	1	Standard—	—	—	Order basic starter plus separate handle guard kit.	SMFFG5	54.00	SMFFGJ5	62.00	—	—	SMFFW1 [Ⓞ]	173.00	SMFFR1 [Ⓞ]	189.00
		With Red Pilot Light—	—	—		SMFFG5P	77.00	SMFFGJ5P	85.00	—	—	SMFFW1P [Ⓞ]	235.00	SMFFR1P [Ⓞ]	204.00
	With (2) ¾" Pipe Tap and Red Pilot Light—	—	—	—		—	—	—	—	—	—	SMFFW1PH	250.00	—	—
	With (2) ¾" Pipe Tap and Red Pilot Light—	—	—	—		—	—	—	—	—	—	SMFFW2 [Ⓞ]	181.00	SMFFR2 [Ⓞ]	196.00
2	Standard—	—	—	SMFFG6	62.00	SMFFGJ6	69.00	—	—	SMFFW2P [Ⓞ]	243.00	—	—		
	With Red Pilot Light—	—	—	SMFFG6P	87.00	SMFFGJ6P	92.00	—	—	SMFFW2H	196.00	SMFFR2H	212.00		
											FW2PH	258.00	—	—	

Duplex Units—Class SMF, Single Phase

Type of Operator	Number of Poles	Features	General Purpose Flush Mounting (Open with Flush Plate)				NEMA Type 1 General Purpose Enclosure Surface Mounting		Replacement Starters	
			Gray Flush Plate For Wall or Cavity Mounting		Stainless Steel Flush Plate for Wall or Cavity Mounting		Catalog No	Price \$	Catalog No	Price \$

One Starter in Duplex Enclosure—Class SMF, Single Phase

Toggle	2	Standard— With Red Pilot Light—	—	—	—	—	SMFFG02	85.00	—	—
Key	2	With Red Pilot Light—	—	—	—	—	SMFFG02P	108.00	—	—
							SMFFG04P	108.00	—	—

Two Starters In Duplex Enclosure—Class SMF, Single Phase[Ⓞ]

Toggle	2 Per Starter	Standard— With Red Pilot Light on Each—	SMFFF222	123.00	—	—	SMFFG222	131.00	—	—
Key	2 Per Starter	With Red Pilot Light on Each—	SMFFF222P	208.00	SMFFS22P	216.00	SMFFG222P	216.00	—	—
			SMFFF44P	239.00	SMFFS44P	247.00	SMFFG44P	247.00	—	—

Starter And "Auto-Off-Hand" SPDT Selector Switch (AC Only)—Class SMF, Single Phase

Toggle	1	Standard— With Red Pilot Light—	SMFFF71	112.00	—	—	SMFFG71	119.00	—	—
	2	Standard— With Red Pilot Light—	SMFFF71P	135.00	SMFFS71P	143.00	SMFFG71P	143.00	—	—
Key	2	Standard— With Red Pilot Light—	SMFFF72	119.00	—	—	SMFFG72	127.00	—	—
	2	With Red Pilot Light—	SMFFF72P	143.00	SMFFS72P	150.00	SMFFG72P	150.00	—	—
			SMFFF74P	158.00	SMFFS74P	166.00	SMFFG74P	166.00	—	—

Two Speed Starters (AC Only)—Class SMF, Single Phase[Ⓞ]

Toggle	1	With Mechanical Interlock: Standard— With 2 Red Pilot Lights—	SMFFF11	162.00	—	—	SMFFG11	169.00	SMFFO1T	46.00
		With HIGH-OFF-LOW Selector Switch: With 2 Red Pilot Lights—	SMFFF11P	247.00	—	—	SMFFG11P	254.00	—	—
	2	With Mechanical Interlock: Standard— With 2 Red Pilot Lights—	—	—	SMFFS101P	254.00	—	—	SMFFO1PT	69.00
		With HIGH-OFF-LOW Selector Switch: With 2 Red Pilot Lights—	SMFFF22	177.00	—	—	SMFFG22	185.00	SMFFO2T	54.00
			SMFFF22P	262.00	—	—	SMFFG22P	270.00	—	—
			—	—	SMFFS202P	270.00	—	SMFFO2PT	77.00	

[Ⓞ]Furnished with (1) ¾" pipe tap in bottom (reversible for top feed).

[Ⓞ]Two heater elements required.

Heater Elements, Class SMF



Heater Elements Class SMF

All tables are based on the operation of the motor and controller in the same ambient temperature, 40°C (104°F) or less. Always be certain the correct heater element is installed in the starter before operating the motor.

Ordering Information

- Determine number of heater elements required from Table A.
- Determine motor full load current and service factor.

NOTE: If motor amps are unknown, an approximate value may be found on page 883.
These values should be used with caution and only when motor amps are not available.
- If the motor and controller are in the same ambient temperature:
 - For 1.15 to 1.25 service factor motors use 100% of motor full load current for heater element selection.
 - For 1.0 service factor motors use 90% of motor full load current for heater element selection.
- If the motor and controller are in different ambient temperatures multiply motor full load current by the multiplier in Table B. Use the resultant full load current for heater element selection.
- Select proper heater element from table below.

Heater Catalog No	Motor Full-Load Current (Amps)	Price \$
SMFH01	0.157–0.173	11.60
SMFH02	0.174–0.192	11.60
SMFH03	0.193–0.212	11.60
SMFH04	0.213–0.235	11.60
SMFH05	0.236–0.261	11.60
SMFH06	0.262–0.289	11.60
SMFH07	0.290–0.321	11.60
SMFH08	0.322–0.355	11.60
SMFH09	0.356–0.399	11.60
SMFH10	0.41–0.44	11.60
SMFH11	0.45–0.49	11.60
SMFH12	0.50–0.53	11.60
SMFH13	0.54–0.58	11.60
SMFH14	0.59–0.65	11.60
SMFH15	0.66–0.71	11.60
SMFH16	0.72–0.78	11.60
SMFH17	0.79–0.85	11.60
SMFH18	0.86–0.96	11.60
SMFH19	0.97–1.04	11.60
SMFH20	1.05–1.16	11.60
SMFH21	1.17–1.25	11.60
SMFH22	1.30–1.39	11.60
SMFH23	1.38–1.54	11.60
SMFH24	1.48–1.63	11.60
SMFH25	1.57–1.75	11.60
SMFH26	1.66–1.86	11.60

Heater Catalog No	Motor Full-Load Current (Amps)	Price \$
SMFH27	1.80–1.99	11.60
SMFH28	1.96–2.15	11.60
SMFH29	2.16–2.38	11.60
SMFH30	2.39–2.75	11.60
SMFH31	2.76–2.84	11.60
SMFH32	2.85–3.06	11.60
SMFH33	3.07–3.45	11.60
SMFH34	3.46–3.70	11.60
SMFH35	3.71–4.07	11.60
SMFH36	4.08–4.32	11.60
SMFH37	4.33–4.90	11.60
SMFH38	4.91–5.35	11.60
SMFH39	5.36–5.85	11.60
SMFH40	5.86–6.41	11.60
SMFH41	6.42–6.79	11.60
SMFH42	6.80–7.57	11.60
SMFH43	7.58–8.15	11.60
SMFH44	8.16–8.98	11.60
SMFH45	8.99–9.67	11.60
SMFH46	9.68–9.95	11.60
SMFH47	9.96–10.8	11.60
SMFH48	10.9–12.1	11.60
SMFH49	12.2–13.1	11.60
SMFH50	13.2–13.9	11.60
SMFH51	14.0–15.0	11.60
SMFH52	15.1–16.0	11.60

Table A
Number of Heater Elements

Device	Number of Heater Elements	Notes
SMF-F*1 SMF-F*2 SMF-F*3 SMF-F*4 SMF-F*5 SMF-F*6	1	All single pole and two pole SMF starters require only 1 Heater Element.
SMF-F*22 SMF-F*44	2	Duplex Unit. One Heater Element per starter.
SMF-F*11 SMF-F*22	2	Two Speed Starter. One Heater Element per speed.

Note: SMFH** Heater Elements are not interchangeable with MSFG30M** Heater Elements used on obsolete MSF manual starter line. MSFG30** Heater Elements are available for replacement purposes, contact sales office for availability. SAGGMGF.

Table B—Special Applications
Heater Element Selection

Continuous Duty Motor Service Factor	Melting Alloy Type Thermal Overload Relays		
	Ambient Temperature of Motor		
	Same as Controller Ambient	Constant 10°C (18°F) Higher Than Controller Ambient	Constant 10°C (18°F) Lower Than Controller Ambient
Full Load Current Multiplier			
1.15 to 1.25	1.0	0.9	1.05
1.0	0.9	0.8	0.95

2
NEMA and HP
Rated Control