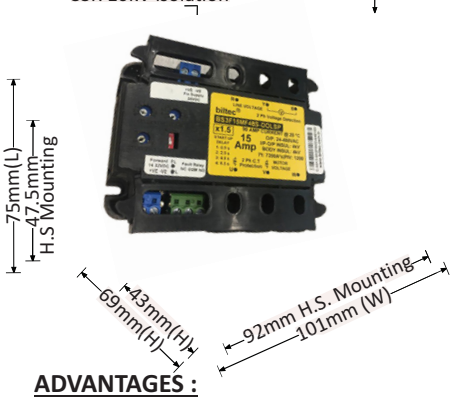
SOLİD STATE RELAY

BS3F5MFR48S 5A 2,2KW
BS3F10MFR48S 10A 3,7KW
BS3F15MFR48S 15A 5,5KW

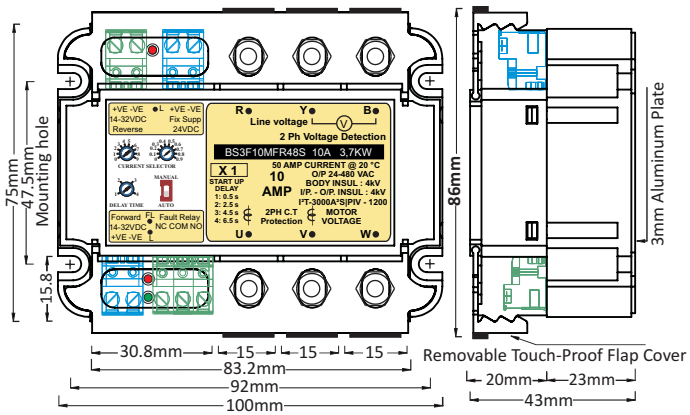
3 PH FORWARD/REVERSE SEMICONDUCTOR MOTOR STATER WITH OVERLOAD /SINGLE PHASE PROTECTION
CURRENT AND VOLTAGE DETECTION

35mm Plastic Din Rail to SSR 10kV isolation

Max. 25Sqmm Lugs



TYPE "E-75"
Model 905- 1 Nos.
Current upto 21Amp @40°C with Din Rail 45mm
Thermal Resistance
$R_{\theta SA}$ = 3°C/W
$R_{\theta SA}$ = 278.15 K/W
ΔT= 75°C
Surface Area:
267mm²X75mm
=20025 mm³
101mm(W) X 75mm(L) X 15mm(H) + SSR
Weight : @ 119gms



ADVANTAGES :

- Over load current setting by POT
- Starting delay timer POT for initial inrush current bypass
- Output will be OFF during any Fault conditions like Phase Failure, Overload, Single phasing etc.
- Single module for Forward and Reverse of 3 phase motor with inbuilt motor protection via current and voltage detection
- If both forward and reverse input signal is given then there will be interlocking of circuit and output will be OFF within 4.8 µs
- No need to use external bimetallic overload relay or MPCB protection
- Very compact design which occupies less space and has easy panel wiring
- Remote fault indication via mechanical changeover relay
- Selectable starting delay timer POT to disable false fault detection due to initial inrush current.
- Starting delay timer can solve locked rotor/shaft problem.
- Output will be OFF if there is current inrush after fixed delay time.
- For any Fault, when current exceeds 150mA output will be OFF within 500 ms
- Minimum time between Forward & Reverse Switching is 30 ms

ORDERING FORMAT

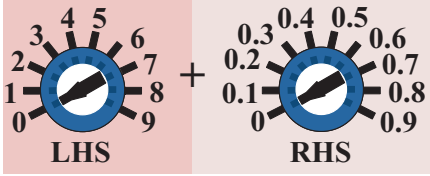
OLSP : Overload Single Phase Protection
Output Voltage — 48: 24-480 VAC
Control Input — 01 : 14-32 VDC
3FR : 3 Phase Forward - Reverse
Zero Cross Over DC Input TO AC Output
Output Current Rating — 05,10,15

BS3F5MFR48S 5A 2,2KW
BS3F10MFR48S 10A 3,7KW
BS3F15MFR48S 15A 5,5KW

NOTE 1 : Available for 05,10,15Amp with Auto & Manual Reset Switch.
NOTE 2 : Optional 5-32 VDC Control Input can be available.

Fault condition	SSR Output	Fault red LED indication	Fault Mechanical Relay Change Over
Current Overload	OFF	YES	YES
Single Phasing	OFF	YES	YES
Input Phase Failure	OFF	YES	YES
Phase Unbalance	OFF	YES	YES
Locked Rotor / Shaft	OFF	YES	YES
Earth Fault	OFF	YES	YES

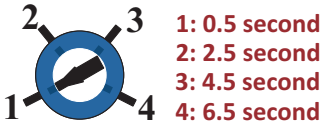
OVER CURRENT SELECTOR POT



MULTIPLIER	CURRENT RATING
X 0.5	05 A
X 1	10 A
X 1.5	15 A

Ex. LHS (2)+RHS (0.6)=2.6x 0.5 =1.3 Amp (05 Amp Current Rating SSR) BS3F5MFR48S 5A 2,2KW
Ex. LHS (7)+RHS (0.1)=7.1x 1 =7.1 Amp (10 Amp Current Rating SSR) BS3F10MFR4S 10A 3,7KW
Ex. LHS (9)+RHS (0.9)=9.9x 1.5 =14.85 Amp (15 Amp Current Rating SSR) BS3F15MFR48S 15A 5,5KW

STARTING DELAY TIME POT



1: 0.5 second
2: 2.5 second
3: 4.5 second
4: 6.5 second

MANUAL/AUTO RESET SWITCH

Manual Reset: Output will be latched for any fault condition and reset after switching OFF/ON 24 VDC fix supply
AUTO Reset: Output will be latched for 18 seconds for any fault condition and reset after every 18 seconds.

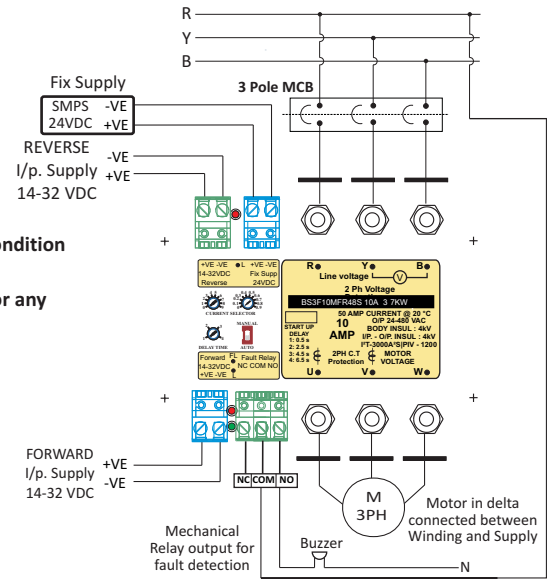
SSR SELECTION FOR 3 PHASE MOTOR (INDUCTIVE LOAD)

HP / kW Rating	05 AMP	10 AMP	15 AMP
HP Rating	Upto 3	Upto 5	Upto 7.5
kW Rating	Upto 2.2	Upto 3.7	Upto 5.5

APPLICATIONS:

- LAMINATION EXTRUSION
- ACTUATORS
- CNC MACHINES
- CRANE MOTOR

3 PH FORWARD/REVERSE SEMICONDUCTOR MOTOR STATER WITH EXTERNAL SHORT CIRCUIT PROTECTION DEVICE CONNECTION DIAGRAM



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General Specification

Max Barrier Layer Temperature (T_{max})	< 125 °C
Ambient Temperature Range (T_{amb})	0-85 °C
SSR Storage Temperature Range (T_{st})	-40°C to 80°C
Input Terminal Screw Torque Range	T = 0.5 N.m (Max.)
Output Terminal Screw Torque Range	T = 2.5 N.m (Max.)
Power Factor COSϕ @Max. Load @480VAC	> 0.55
Housing Material	UL-94 V0 Grade
Base Plate	Aluminium
SSR Weight	> 430 grams
Control Input Electrical Wire Size (Max.)	Up to 2.1 sq mm(14 AWG)
Power Output Electrical Wire Size (Max.)	Up to 25 sq mm(3 AWG)
Test Standards:	ROHS,IP20
Pollution Degree	3
Pending Approvals:	UL 508,VDE ,TUV ,CSA 22-2 IEC 60947-5-1:2016 IEC 60947-4-2

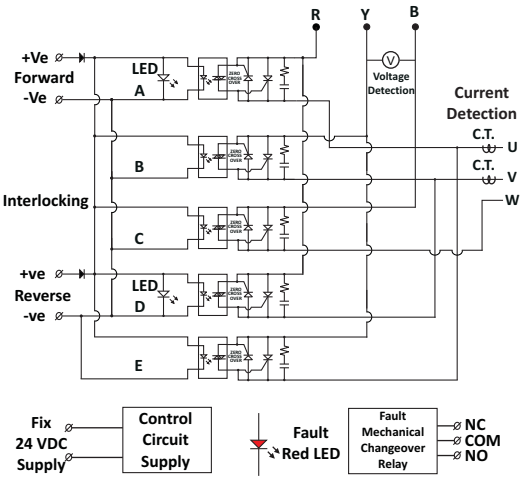
Parameter	Unit	ZDA
Forward & Reverse Control Voltage Rage (V_C)		14-32VDC
	mA	5-6mA
Reverse Surge voltage Protection V_{PK}	VAC/VDC	325VAC/DC
Fix Supply Voltage (V_S)	VDC	22-26 VDC
Fix Supply Current Consumption	mA	38 mA
Fix Supply Voltage Surge Protection	VDC	80 VDC
Max. Input current at time of interlocking condition	mA	12 mA
Interlocking time duration	µS	< 5 µS
Input Impedance (Current Regulator Circuit Impedance)	Ω	1 kΩ - 2 kΩ
Minimum Turn ON Voltage(V_{ON})	VDC	1.5 VDC
Turn OFF Voltage(V_{OFF})	VDC	< 13 VDC
Forward Control Input Status	-	GREEN LED
Reverse Control Input Status	-	RED LED
Maximum Turn ON Time	mS	⩽1/2 Cycle(10 mS)
Maximum Turn OFF Time	mS	⩽1/2 Cycle(10 mS)

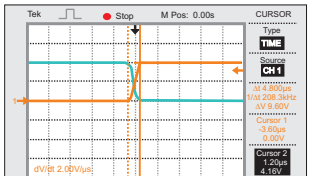
Output Technical Specifications @ 25°C Unless Specified

Parameters	Symbol	Unit	05 Amp	10 Amp	15 Amp
Rated Operational Voltage	U_e	V_{RMS}	24-480 VAC 3Q TRIAC	24-480 VAC BACK TO BACK SCR	
Operating Frequency Range	f	Hz	47-63 Hz		
Peak Inverse Voltage	PIV	V_{PK}	1200	1200	1200
Max. Surge Voltage With Stand Capacity (<1 Second) (U_i)	**V_{surge}**	**V_{RMS}**	**2700 V_{RMS}(3800 V_{PK})**		
Rated Operational Current AC53a @ 40°C(Inductive Load-Motor)	**I_e**	**Amp**	**5**	**10**	**15**
Rated Operational Current AC53a @ 20°C	I_T	Amp	40	60	90
Maximum 3 Phase Motor Rating	hp	hp	3 hp	5 hp	7.5 hp
	kW	kW	2.2	3.7	5.5
NON Repetitive Surge Peak ON-State Current @ Rated V_{RRM} applied for 1/2 Cycle t=10 mS/ t=8.33 mS (50 Hz/60 Hz)	I_{TSM} @ 50 Hz	Ap	420	800	1200
	I_{TSM} @ 60 Hz		441	840	1260
Max. I^2t for Fusing @ t=10 mS (50Hz)	I^2t	A^2s	880	3000	7200
Max. I^2t for Fusing @ t=8.33 mS (60Hz)	I^2t	A^2s	795	2750	6510
Max. Peak ON-state voltage Drop	V_{TM}	V_{RMS}	⩽1.2	⩽1.2	⩽1.2
Min. Isolation Resistance between F-R Input Terminals (-R1,+R2) & (-F1,+F2) to Output Terminals R,Y,B,U,V,W) @ 500 VDC	Ω	GΩ	50	50	50
Isolation Voltage F-R Input Terminals (-R1,+R2) & (-F1,+F2) to Output Terminals (R,Y,B,U,V,W) for 1 Minute **(U_{imp})**	V_{ISO}	kV	4	4	4
Isolation Voltage I/P & O/P Terminal (-R1,+R2,-F1,+F2,R,Y,B, U,V,W) to Body Isolation for 1 Minute**(U_{imp})**	V_{ISO}	kV	4	4	4
Max. Rate of Rise OFF-State Voltage	dV/dt	V/µS	500	600	1000
Max. Rate of Rise OFF-State Current	di/dt	A/µS	50	100	150
Max. Peak Repetitive Forward OFF-State Voltage	V_{DRM}	V	800	1200	1600
Max. Peak Repetitive Forward OFF-State current	I_{DRM}	mA	0.05	0.1	0.05
Max. Peak repetitive reverse off-state Voltage	V_{RRM}	V	800	1200	1600
Max. Peak repetitive reverse off-state current	I_{RRM}	mA	0.05	0.1	0.05
Max. DC Gate Trigger Voltage	V_{GT}	V	1.5	1.5	1.5
Max. DC Gate Trigger Current	I_{GT}	mA	50	8.8	20
Turn OFF Time	t_q	µS	35	120	200
Maximum Latching Current	I_L	mA	100	160	200
Maximum Holding Current	I_H	mA	60	150	150
Thermal Resistance Rθ (Junction to case)	$R_{\theta(j-c)}$	°C/W	1.1	1	0.32
OFF State SSR Leakage Current @ Rated Voltage & Frequency (Snubber Leakage)(I_L)	I_{leak}	mA	< 2 mA	< 2 mA	< 2 mA
SCCR Current Rating	I_{SCCR}	kA	-	10 kA	10 kA
SSR Weight	W	gram	430	450	450
Output Fault Indication	Red LED & Mechanical Relay change over 230 VAC-1Amp				

	FORWARD	REVERSE	FAULT
LED INDICATION	GREEN	RED	RED

Circuit Diagram-
BS3F10MFR48S 10A 3,7KW





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