

Dold Standstill Monitor Relays



UG6946-02PS-40

Dold speed monitoring safety relay modules provide safe standstill detection on 3-phase and single-phase motors by monitoring remanence voltage.

- Can monitor motor voltages up to 690 VAC or VDC
- No external sensors necessary
- Independent of direction
- Broken wire detection
- Monitors rotation and linear movement
- 2-channel operation for standstill monitoring
- Up to 3 NO and 1 NC positive-guided safety contacts
- LED status indicator
- Adjustable voltage setting
- Adjustable standstill time delay
- Semiconductor outputs for monitoring

Safety Data – Values per EN ISO 13849-1

Category	4 according to EN ISO 13849-1
Performance level	PL _e according to EN ISO 13849-1
MTTF_d	>93 years for LH5946 >222 years for UG6946
DC_{avg}	99%

Safety Data – Values per IEC/EN 62061 /IEC/EN 61508

SIL CL	3 per IEC/EN 62061
SIL	3 per IEC/EN 61508
HFT (Hardware Failure Tolerance)	1
DC_{avg}	99%
PFH_D	4.10 x 10 ⁻¹⁰ for LH5946 4.20 x 10 ⁻¹⁰ for UG6946

Safety Standstill Monitor Relays Selection Chart

Part Number	Price	Marking Type	Voltage Monitor Range	Voltage	Outputs	Connection	Muting	Drawing
LH5946-48-24-04	\$526.00	Standstill-monitoring safety relay module	20mV to 400mV	24 VDC	3 NO / 1 NC	Fixed screw terminals	No	PDF
LH5946-PC-24-04	\$526.00			24 VDC		Push-in cage clamp	No	PDF
LH5946-48-115-04	\$526.00			115 VAC		Fixed screw terminals	No	PDF
LH5946-PC-115-04	\$526.00			115 VAC		Push-in cage clamp	No	PDF
UG6946-02PS-04	\$347.00			24 VDC	2 NO / 1 NC	Pluggable screw terminals	No	PDF
UG6946-02PS-001-04	\$367.00			24 VDC		Pluggable screw terminals	Yes	PDF
LH5946-48-24-40	\$526.00		200mV to 4V	24 VDC	3 NO / 1 NC	Fixed screw terminals	No	PDF
LH5946-PC-24-40	\$526.00			24 VDC		Push-in cage clamp	No	PDF
LH5946-48-115-40	\$526.00			115 VAC		Fixed screw terminals	No	PDF
LH5946-PC-115-40	\$526.00			115 VAC		Push-in cage clamp	No	PDF
UG6946-02PS-40	\$347.00			24 VDC	2 NO / 1 NC	Pluggable screw terminals	No	PDF
UG6946-02PS-001-40	\$367.00			24 VDC		Pluggable screw terminals	Yes	PDF

Note: The -04 models are recommended for applications where motors are controlled directly from contactors.

The -40 models are recommended for applications involving VFDs or soft starters where OFF-state leakage is present and higher voltage settings are required.

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Safety Standstill Monitor Relays Specification Table

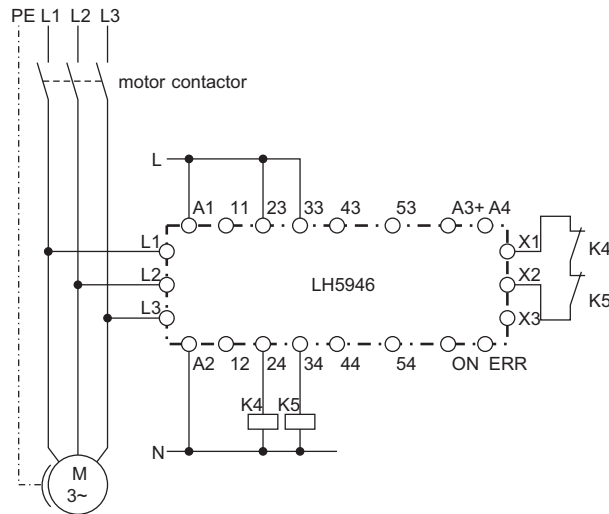
General Specifications		LH5946				UG6946																					
Temperature		Storage: -40°C to 75°C [-40°F to 167°F]]																									
Altitude		< 2,000m [6562ft]																									
Vibration Resistance		Amplitude: 0.35 mm Frequency: 10 to 55 Hz (IEC/EN 60068-2-6)				Amplitude: 0.075 mm Frequency: 10 to 57 Hz (IEC/ EN 60068-2-6)																					
Degree of Protection		Housing: IP40 Terminals: IP20																									
Housing		Thermoplastic with VO behavior; DIN rail mount																									
Weight		400g [14.11 oz.]				295g [10.41 oz.]																					
Agency Approvals and Standards		cULus file E107778, CE, TUV																									
Wire Connections		1x AWG 20-12 solid or stranded 2x AWG 20-14 solid or stranded				1x AWG 24-12 solid or stranded 2x AWG 24-18 solid or stranded																					
Wire Fixing		Plus-minus terminal screws M3.5 box terminals with wire protection. Torque 0.8 Nm [7 lb•in]				Captive slotted screw. Torque 0.8 N•m [7 lb•in]																					
Input Specifications																											
Nominal Voltage		24VDC, 115VAC, 230VAC				24VDC																					
Measuring/Motor Voltage		690 VAC/VDC (for UL applications, max 600 VAC/VDC)																									
Input Resistance		500KΩ																									
Response Value U_{an}		20mV to 400mV, adjustable or 0.2 V to 4V adjustable																									
Response Value Dependent on Frequency		<table><tr><th>Input Frequency (Hz)</th><td>50</td><td>100</td><td>200</td><td>400</td><td>600</td><td>1k</td><td>1.5k</td><td>2k</td></tr><tr><th>Response Value U_{an}</th><td>1.0</td><td>1.1</td><td>1.2</td><td>1.5</td><td>2.0</td><td>2.8</td><td>5</td><td>8</td></tr></table>								Input Frequency (Hz)	50	100	200	400	600	1k	1.5k	2k	Response Value U_{an}	1.0	1.1	1.2	1.5	2.0	2.8	5	8
Input Frequency (Hz)	50	100	200	400	600	1k	1.5k	2k																			
Response Value U_{an}	1.0	1.1	1.2	1.5	2.0	2.8	5	8																			
Voltage Range		AC: 0.8 to 1.1 U_N At 10% residual ripple: 0.9 to 1.1 U_N DC: 0.9 to 1.2 U_N At 10% residual ripple: 0.9 to 1.1 U_N				DC: 0.9 to 1.2 U_N At 10% residual ripple: 0.9 to 1.1 U_N																					
Nominal Consumption		3W																									
Nominal Frequency		50 to 60 Hz. Frequency range: 45 to 65 Hz				N/A																					
Control Current		Control current typical at 24V over two relays: 75mA																									
Overvoltage Protection		Internal VDR (Voltage Dependent Resistor)																									
Output Specifications																											
Electrical Contact Life		To AC15 at 3A, 230V: 2x10 ⁵ switching cycles IEC/EN 60 947-5-1																									
Mechanical Life		50 x 10 ⁶ switching cycles				20 x 10 ⁶ switching cycles																					
Contact Type		3 NO positively driven and 1 NC relay contacts (NO contacts are safety contacts)				2 NO positively driven and 1 NC relay contacts (NO contacts are safety contacts)																					
Operate Delay on Standstill		Depends on setting; adjust by potentiometer																									
Release Delay for Detection of Running Motor		< 100ms																									
Nominal Output Voltage		250VAC				250VAC (for NO contacts) 24VDC (for NC contacts)																					
Thermal Current (I_{th})		5A per contact See continuous current limit curve in manual.				5A (for NO contacts) 2A (for NC contacts) See quadratic total current limit curves in manual.																					
Short Circuit Strength		Max fuse rating: 4 AGL (IEC/EN 60 9470-5-1), line circuit breaker C6A																									
Switching Capacity IEC/EN 60 947-5-1		AC 15: NO contacts: 3A/230V NC contacts: 1A/230VAC DC13: 4A/24V				AC 15: NO contacts: 3A/230V DC13: 4A/24V																					
Switching Frequency		Max. 1,200 switching cycles/hr																									
Semiconductor Monitoring		100 mA DC 24V; supply via A3+/A4				N/A																					

Dold LH5946

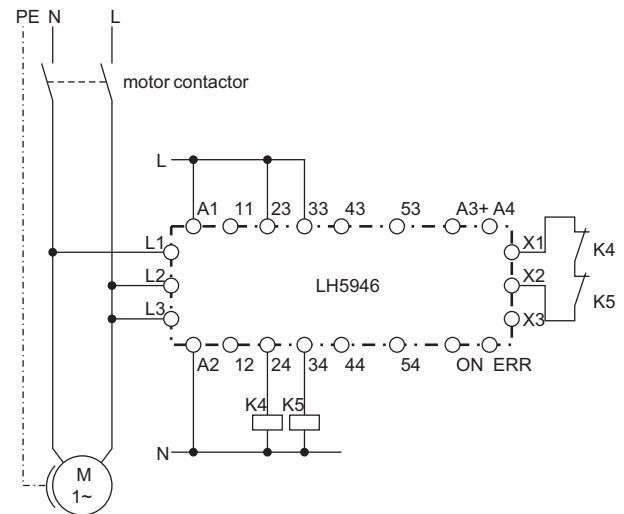
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Applications

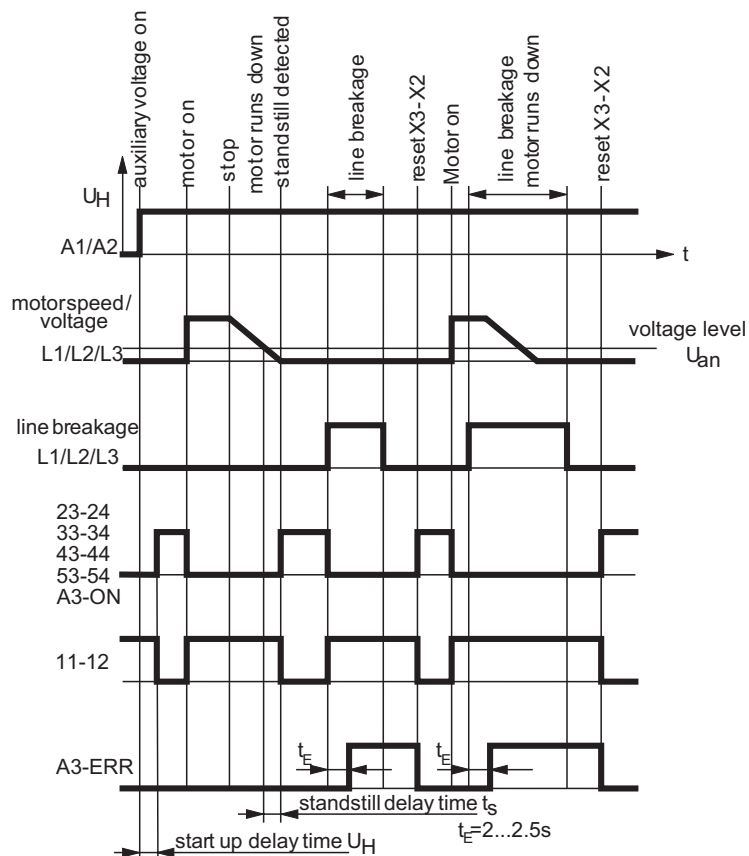


With 3-phase motor



With single-phase motor

Function diagram



Connection Terminals

Terminal Designation	Signal Description
L1-L2-L3	Connection to monitored motor
11-12	Safety contacts (NC)
23-24, 33-34, 43-44	Safety contacts (NO)
53-54	Monitoring contact (NO)
X1-X2	Connection of feedback circuit (for external contactors)
X2-X3	Manual reset for external faults
A1-A2	Auxiliary supply (UH)
A3(+)-A4	Supply for semiconductor outputs
ON:	Semiconductor output indicates state of safety contacts
ERR:	Semiconductor output indicates failures

Note: The outputs 53-54, ON and ERR are only monitoring outputs and must not be used in safety circuits.

Setting

Potentiometer U_{an}	Adjustment of voltage level for standstill detection
Potentiometer t_s	Adjustment of time delay before activation of safety contacts

Safety Products



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