Micro Control Systems

APPLICATION NOTE
APP-097

INT69 HBY Diagnose
Installation and Flash Code Description

Revision History

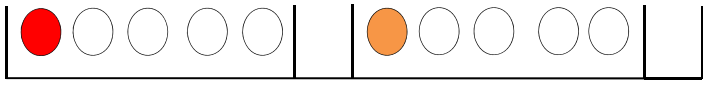
Date	Author	Description
09/03/14	JLM	Created initial version
10/24/14	JLM	Updated wiring diagram

Description

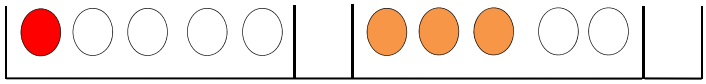
Hanbell supplies INT69 HBY Diagnose for motor protection with monitoring functions of phase loss, phase sequence, motor temperature, and discharge temperature. The module has built in flash codes that are helpful for diagnosing safety faults.
In order to protect the compressor, each RC2 series compressor has been built with three PTC temperature sensors inside the motor coil and one at the discharge port neck of the compressor. These sensors are connected to the motor module to monitor coil temperature and discharge temperature. Up to 9 sensors can be connected in series and used with one module.
If the temperature in one of the positions monitored exceeds nominal response temperature of the respective PTC thermistor (230° F, 4.5kΩ ± 20%), the sensor resistance increases and the module trips (M1 and M2 open). The failure results in a lockout. The module resets when the response temperature drops 3kΩ (when temp decreases below 212°F, 2.75kΩ ± 20%). 5 min delay for the first PTC failure, 60 min delay for the 2nd failure, latching lockout for the 3rd within 24 hour period. Monitoring is inactive for 20 seconds after motor stop to prevent nuisance trips from brief reverse rotation.
Phase failure (loss) and Phase sequence safety trips result in a first time lockout. Phase sequence monitoring is active 1 second after motor start for 10 seconds. Phase loss is monitored 1 second after motor start till motor stop.
Lockout and time delay can be cancelled by interrupting power to the module for 5 seconds. An optional power supply reset button can be added to electrical connection box.

Flash Codes

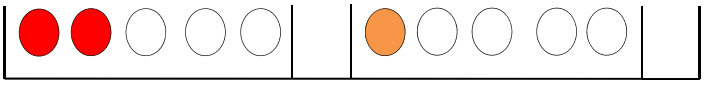
PTC Temperature Error



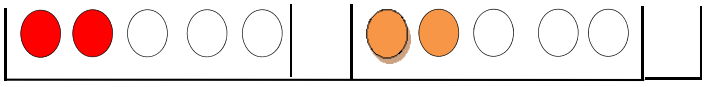
Timer delay active (PTC < Reset)



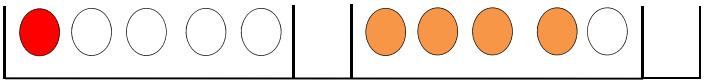
Phase Sequence



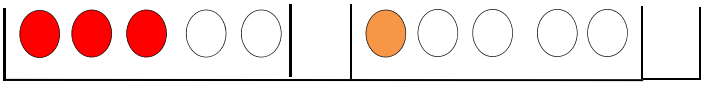
Phase failure



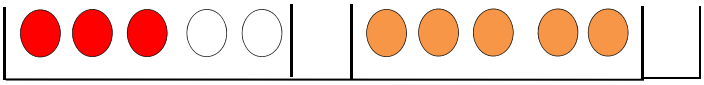
Sensor Input Error



Supply Voltage Too Low



Reset delay for “Supply Voltage Too Low”



Flash Code Overview

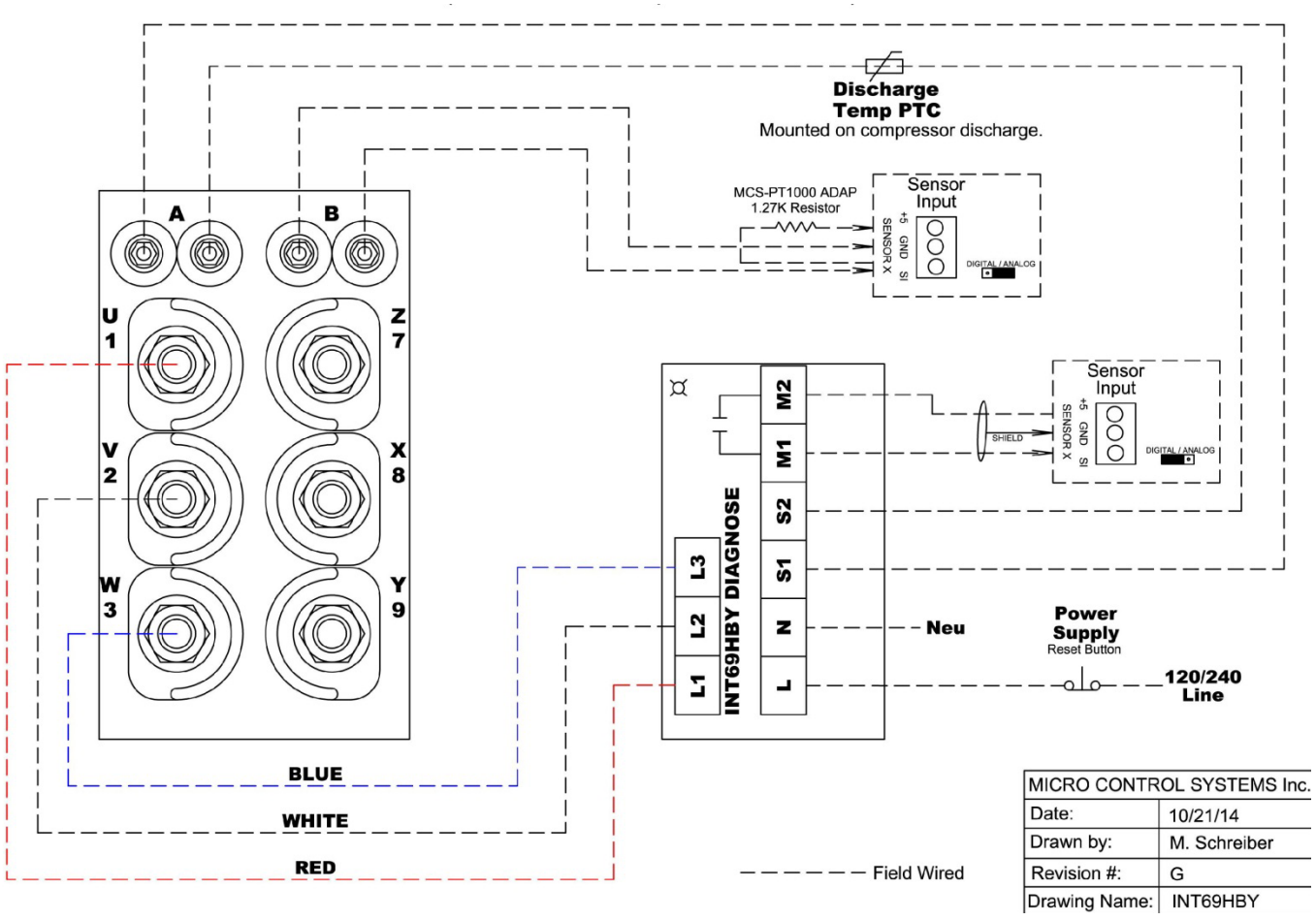
Green lit	Compressor Operational
Green flashing	Compressor Running
Red/Orange flashing	Error, Compressor is switched off; for description see table below

1st flashing sequence (Red LED)	**2nd flashing sequence (Orange LED)**	**Description**
1	1	Motor temperature; Static switch off, Permissible winding temperature exceeded
	3	Motor temperature; Reset delay after static switch off
	4	Motor temperature; Sensor input detected open circuit or short circuit
2	1	Motor voltage; Incorrect phase sequence
	2	Motor voltage; Phase failure/asymmetry
3	1	General; Supply voltage too low
	5	General; Reset delay after “General” error

Error	Active	Condition	Time delay
Motor temperature static trip	Always	Rtrip 4,5kΩ ±20% Rreset 2,75kΩ ±20%	1. / 24h 5min 2. / 24h 60min 3. / 24h locked out Time delay starts after cooling down
Operation cycle limitation	Always	>3 switch off within 30s	5min
Phase sequence	1s after motor start for 10s		Locked out
Phase loss failure	1s after motor start till motor stop, monitoring is inactive for 20 seconds after motor stop to prevent nuisance trips from brief reverse rotation.		Locked out

How to Wire INT69 HBY Diagnose

The following diagram shows the proper wiring connections for the module. The module is connected to L1, L2 and L3 for phase monitoring. Stake on connectors at terminal "A" are connected in series with the discharge PTC and wired back to S1 and S2.



Technical Data

Supply	AC 50/60Hz 115-240V -15...+10% 3VA
Permitted ambient temperature	-30…+70°C
Temperature measuring circuits -Type -Number of sensors -R25, total -Max length connection line	1-2 AMS sensors in series Alternative 1-9 sensors acc. To DIN 44081, DIN 44082 in series <1.8KΩ Trip -- 4.5KΩ ±20% Reset -- 2.75KΩ ±20% 30m
Short circuit monitoring System PTC	typical< 30Ω
Motor voltage	3 AC 50/60 Hz 200-690V ±10%
Reset of lock-out or time delay	Power off > 5s, only possible without active error
Output relay Normally Open contact Mechanical service life	Max. AC 240V, 2,5A, C300 min AC/DC > 24V, >20mA Approx. 1 million switching cycles
Protection class acc. to EN 60529	IP00
Connection type	6,3mm connectors
Housing material	PA, glass-fiber-reinforced
Mounting	Screw mounting
Weight	Approx. 200g
Interface	Diagnose Port (DP)
Dimensions	Refer to dimensions below in mm